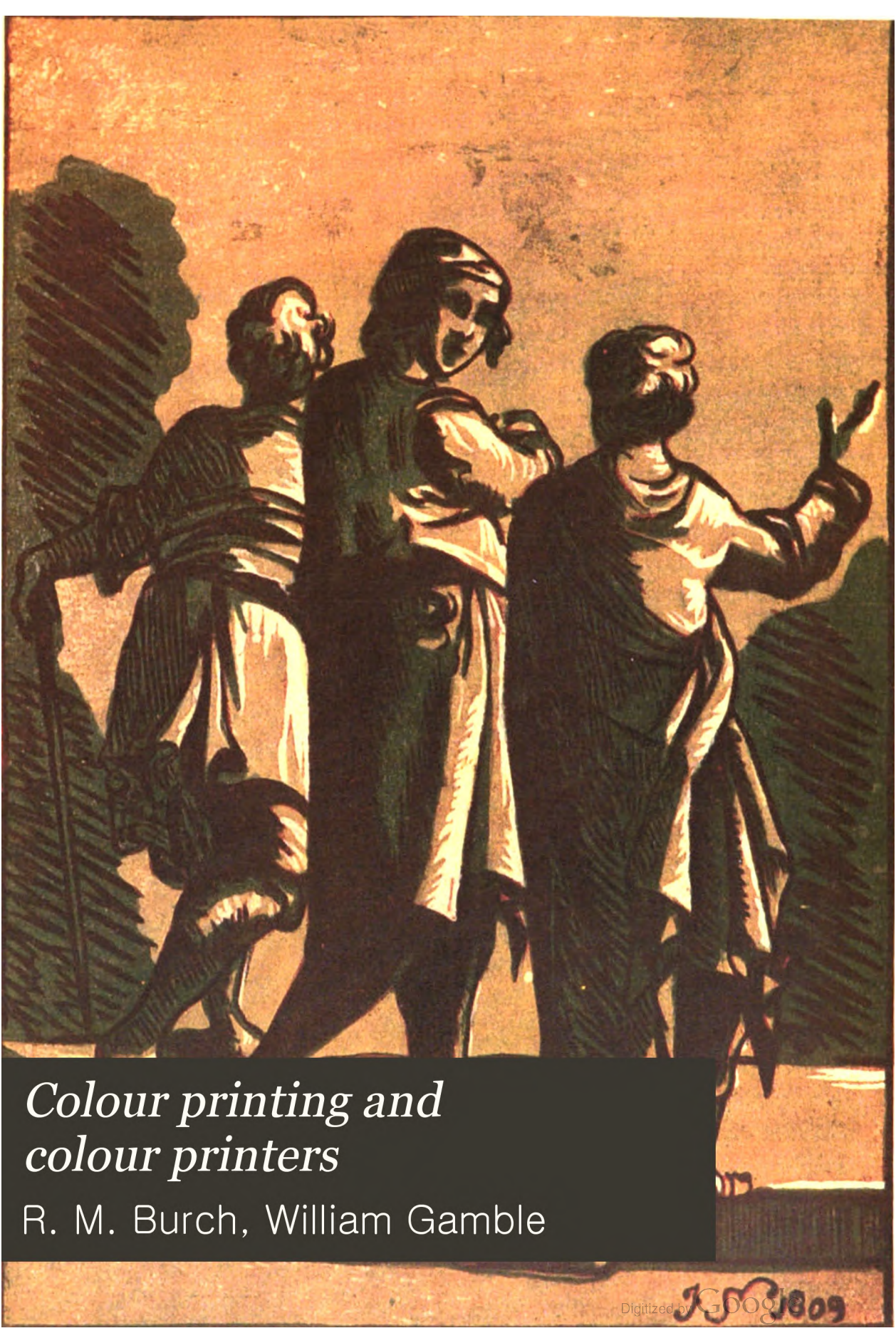

Colour printing and colour printers

R. M. Burch, William Gamble

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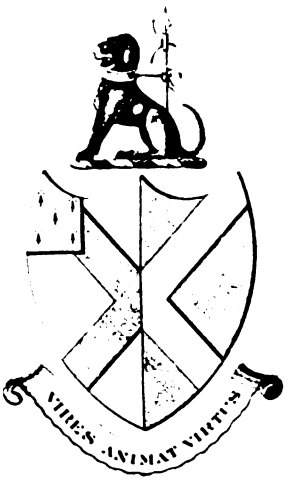

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COLOUR PRINTING AND COLOUR PRINTERS

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COLOUR PRINTERS

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COLOUR PRINTING

AND

COLOUR PRINTERS

BY R. M. BURCH

WITH A CHAPTER ON MODERN PROCESSES BY W. GAMBLE

NEW YORK: THE BAKER & TAYLOR CO.
1910

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PREFACE

COLOUR printing is of three orders, relief, intaglio, and planographic. The first includes such processes as printing from wood blocks, photo-engraved surfaces, and stereotype and electrotype plates, and is, in its inception, the oldest of all the methods of producing printed pictures. Engraving in intaglio comes next in point of age, dating from as early as 1470-80, if not before, and the arts of engraving in line or stipple on copper or steel plates, etching, mezzotinting, aquatinting, and photogravure come under this head. There is, of course, no absolute planographic printing—the class to which lithography belongs—as even the ink on the surface of the stone, or zinc or aluminium plate stands out in slight relief. Each of these three styles of printing requires a different kind of press or machine.

As colour printing cannot be done without coloured inks, a few words on that branch of the subject will be of interest. Moxon, the earliest English writer on printing (London, 1683), did not refer to any other ink than black, but the use of vermilion in making red is touched upon by M. D. Ferzol, in his *Science Pratique de l'Imprimerie* (St. Omer, 1722), this being possibly the first technical reference to coloured printing ink. In the fifth volume of the *Encyclopédie Méthodique* (1751) appeared an article on printing by M. Breton, who then held the office of printer to the King of France. He stated that although red and black inks were the only sorts in common use, others could be prepared by substituting verdigris for lamp black or vermilion, where a green ink was required; Prussian blue for blue ink; orpiment for yellow ink, or fine lake for violet ink. These pigments were to be calcined, mixed with white lead, and then incorporated with varnish in the usual way. Papillon, in his treatise on wood engraving, supplemented this by saying

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that a wood coloured ink could be made from umber, and a bistre one from wood soot. He also recommended the use of indigo and Indian ink. The first English patent connected with the manufacture of coloured ink for printing purposes is that of James Rowley in 1772. This was for use in printing playing-cards from copper plates in oil colours, "with a peculiar kind of ink which will bear the leesing or polish necessary to be given to playing-cards, which no other ink known to the printers or card-makers is capable of." The ink was compounded of the ordinary ingredients used for making-up colours for painting the cards by hand, but instead of mixing them with water, Rowley used linseed oil and alum, boiled and calcined. Savage, in his book on the subject, says that prior to the publication of his work on *Decorative Printing* nearly all typographers who essayed to print with coloured inks had been baffled. Only a very few ink-makers were able to supply such sorts, and it was generally found that what was supplied was not really suitable for the purpose. No English writer on printing matters appears to have mentioned coloured inks prior to the publication of Nicholson's *Dictionary of Chemistry* in 1795, and he merely referred to red ink, stating that, in order to prepare it, vermilion should be substituted for lamp black. Dr. Rees, writing on Printing Inks in his *Cyclopædia* about the same time, made a similar remark, and also pointed out that the addition of a piece of fish glue the size of a nut, a little brandy, or the white of an egg, had been held by some to improve the lustre of red ink. Savage's *Decorative Printing* contains detailed recipes for making inks of the colours of the eighteen samples he gives.

The present volume is not offered to the reader as a complete history of Colour Printing, but merely constitutes an attempt to indicate some of the lines on which the compilation of such a book might proceed. It is mainly concerned with English colour work, although of course references to what was done in other countries could not very well be excluded,

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particularly in the earlier chapters, and its starting point is the middle of the fifteenth century, from which period printing became general in Europe. There is hardly any room for doubt that movable types were in use in the Far East—in Korea, for instance—for some considerable time before, but this was in all probability quite unknown to Gutenberg and his successors, and so could have had no possible influence upon their work. In any case, there is little or nothing of the kind extant that would lead to the assumption that colour printing was practised in Far Eastern countries prior to 1450, as the earliest Japanese colour prints seem to have been produced about the commencement of the eighteenth century.

In Europe, printing or stamping in colour, for one purpose or another, may have been in use long before Gutenberg's time. It has even been suggested that some art of the kind was practised by the Romans. Cicero, in one of his letters to his friend Atticus, refers to a book which he calls *Peplographia Varronis*, descriptive of a method invented by Varro, whereby a number of copies of a collection of, say portraits, could be made for general distribution. Some seventy years since, several writers were of opinion—and the *Revue des Deux Mondes* adopted the idea—that the pictures were copied by engraving on ivory, and that tinted reproductions of them were made on canvas, by means of several plates. But this notion is now generally abandoned, although the precise nature of the *benignissimum Varronis inventum* is still unknown. To descend from the region of speculation to that of fact, an allusion may be permitted to the so-called *Gospels of Ulphilas*, a work of the fifth or sixth century, preserved in the University Library at Upsala, Sweden, the text of which is in gold and silver, on vellum stained a purple tint. The letters are considered not to have been written in the ordinary way, but stamped from types, heated and impressed on the vellum. Papillon relates a long tale about two Italians, the brothers Cunio, who are said to have engraved on wood a series of pictures illustrating the actions of Alexander the

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Great, and printed impressions from them in 1285. This is, however, now looked upon as a mere fable, whether invented by Papillon or not, although there is no doubt of the antiquity of engraving on wood, an art which was the first in use for producing colour prints. In the South Kensington Museum are some fragments of textile fabrics, bearing patterns which are considered to have been impressed from wood blocks as early as the eleventh or twelfth century, perhaps in the neighbourhood of Cologne. There is a woodcut of the Virgin and Child in the Bibliothèque Nationale at Paris, which Delaborde attributed to 1406, and another at Brussels dated 1418, but the authenticity of the date is doubted. In the Spencer-Rylands Library at Manchester is a woodcut of St. Christopher, dated 1423, which is generally looked upon as the earliest known specimen of the art. A Decree of the Government of Venice, in 1441, was directed to " protecting " the local industry of producing coloured playing-cards and pictures of saints against the importation of foreign goods of that kind. There are nine woodcuts, of mid-fifteenth century date or earlier, preserved in the British Museum, and four of these are printed in brown ink, the colour commonly used for the Block Books, and one, therefore, which appears to have been popular at the time of the invention of printing.

The writer's attention was first directed to the subject of this book several years ago, the outcome being a series of articles on the " History of Printing in Colours," compiled for a trade paper, the *British and Colonial Printer and Stationer*, which appeared at intervals in that periodical during 1903-6. The original matter has, however, been re-written and undergone complete revision, considerable additions being made, whilst at the same time those portions which would have but little general interest were deleted. This latter point the reader is desired to bear in mind, many minor methods of colour printing having been passed over, so that the absence of any mention of a process may be reasonably attributed, not to want of knowledge, but to lack of

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space. This is, for instance, the reason why no reference appears to "Nature Printing" (fully dealt with by Mr. Hardie); Stenochromy; Graphotype; and the letterpress colour printing of the eighties, of which a fine collection of specimens may be inspected at the St. Bride Foundation.

Colour printing, from the point of view adopted in this volume, is printing in any colour other than black, although red, where used for the text of a volume, is not dealt with to any great extent. This being a book on colour printing, not a work on art, it must be borne in mind that when a particular production of the kind is praised, or otherwise, it is not criticised as a work of art, but simply as a piece of colour printing. An object that may possess great interest in another direction may be of hardly any account from a technical standpoint; the Shakespeare First Folio, for example, one of the greatest of English literary landmarks, is almost beneath contempt as a piece of typography. The plan the writer has followed in the compilation of this work is the arrangement of the matter chronologically, as far as possible. There is, of course, a certain amount of overlapping here and there, in order to follow the sequence of a particular branch of colour printing, as, for instance, in the latter part of Chapter IV, where early nineteenth century work is referred to in a section nominally devoted to the eighteenth century. The writer has endeavoured to enlarge, wherever possible, upon points that had not hitherto received much attention at the hands of other historians of the Graphic Arts, rather than to merely repeat what can be found in detail in recent books. Baxter's colour process, for example, has been dealt with so fully by Mr. Courtney Lewis within the last year or two, that it is unnecessary to repeat his facts again. On the other hand, the "licensee printers," who received but little attention at his hands, have been treated at rather more length. The Le Blon process, too, has been handled by several writers of late, so far as its practice in England is concerned, but hardly any attempt had been

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made to follow its fortunes in detail after the inventor's death, a gap which the writer has tried to fill. The production of the " eighteenth century colour print," a subject upon which many pens have been employed, is passed over rather cursorily, as to deal adequately with it would require a good part of this volume; whilst treating it in brief detail would lead to the inclusion of a mere catalogue of engravers' names and works. It is presumed that most of those into whose hands this book will fall have some interest in, or acquaintance with, its subject, either as colour printers, students or admirers of colour printing, or collectors of coloured prints; the use of technical terms has, however, been avoided as much as possible. This being practically the first work devoted exclusively to a history of printing in colours, it is not possible to refer to previous authorities on the same subject, as the writer has mostly compiled his matter first-hand, as the result of a personal inspection of the books or prints referred to. Some useful notes have, however, been gathered from an interesting series of articles on engraving in colour by Baron Roger Portalis, which appeared in the *Gazette des Beaux Arts* in 1888-90. Notices relating to colour printing are scattered through a number of works dealing with various branches of art and industry, and these have been consulted or made use of as far as the writer could gain intelligence of or access to them. Much, no doubt, still remains to be done before a detailed and exhaustive history of printing in colours can be compiled, as every chapter of this work might be expanded into a volume; but whatever the shortcomings of the present compilation may be—most attempts to break new ground in history possess them—they are at least not due to any want of effort on the writer's part. The store of examples of colour printing at the British Museum is not easily accessible except to the experienced worker there, but an excellent and fairly representative collection of specimens may be seen at any time, by anybody interested, at the Technical Library of the St. Bride Foundation, in Bride Lane,

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Fleet Street. In this connection, the writer's thanks are due to Mr. R. A. Peddie, in charge of that section of the Library, for much useful help and many valuable hints.

It will not be out of place here, perhaps, to suggest to the second-hand bookseller that he adopt the habit of describing definitely in his catalogues the nature of the coloured illustrations in the books which pass through his hands. Most of his class appear to think that the term "coloured print" suffices for every possible requirement, regardless of whether the colouring be applied by hand or by the press, and if the latter, to what class the prints belong; *i.e.*, whether intaglio, relief, or lithographic. The writer has tested hundreds of such entries in booksellers' catalogues, only to find that the prints mentioned in nine-tenths of them had been coloured wholly or partly by hand, even in cases where it was distinctly stated that they were "printed in colours." An accurate bibliography of books illustrated by pictures printed in colours would be of considerable service to the future historian of colour printing. Pingrenon, in his *Livres Ornés . . . en Couleur* (1903), gives a long bibliography at the end of the volume, but, so far as the writer has tested it, it is of little more value, from his point of view, than the ordinary bookseller's catalogue, as most of the entries relate to books containing hand-coloured plates, and no attempt is made to separate these from the others.

Regard being had to Mr. W. Gamble's expert knowledge of modern colour printing processes, his chapter descriptive of them is a distinct acquisition to the volume, and serves to bring the subject matter absolutely down to date. The writer's own MS. has also had the advantage of Mr. Gamble's perusal and friendly criticism.

By way of appendix to what is said on pages 67-8 about the German colour-printed botanical plates, it may be mentioned that a few plates of similar character—perhaps inspired by the others, which are of contemporary date—may be seen in Martyn's edition of *Virgil*, London, 1741.

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Since Chapter IV went to press, the writer's attention has been directed to a couple of old colour prints exhibited at the South Kensington Museum, which are undoubted examples of the "mechanical painting" process operated by Boulton & Watt, of Soho (Birmingham), about 1780; this was perhaps identical with the Polygraphic method. They were acquired by Sir Francis Petit Smith (then curator of the Patents Museum, but better known as the inventor of the screw propeller) in 1863, on the occasion of a visit to Sir M. P. W. Boulton. The subjects are a "Sleeping Cupid," in facsimile of Ryland's stipple engraving after Angelica Kauffmann, and "Diana and Endymion" (?). Although it has been alleged that the copies were produced by photographic methods, this cannot be the case, as they differ in various small details. The "Diana" print is apparently in the three primary colours, red, blue and yellow, and to all appearance has been printed from a plate inked *à la poupée*; the other is somewhat similar. The late Mr. Vincent Brooks was of opinion that aquatint was the process used, and an inspection of the uncoloured duplicates exhibited in the same frame tends to confirm the idea. Sir M. P. W. Boulton's "Remarks" on these pictures (1865) does not throw any real light on the subject, although the writer of the notice of Eglinton in the *D. N. B.* seems to think that he (Boulton) fully explained it.

Apropos of what has been said on pages 211-2 about the Arundel Society for Promoting the Knowledge of Art (to give it its full title) it may be mentioned that round about 1870 they acted as publishers, for the South Kensington Museum authorities, of some series of "Chromo lithographs of objects of Art" exhibited there, in several elephant folio parts, only an odd one of which seems to have found its way to the British Museum.

The two-colour initial to Chapter I is copied from one in the *Canon of The Mass* of 1458, mentioned on page 4.

The acknowledgments of both writer and publishers are

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due to Mr. E. Wilfred Evans, for printing, and to Messrs. Warne & Co. for permission to use, one of Miss Kate Greenaway's pictures, as an example of wood-block printing in colours.

The examples of modern colour processes, furnished by representative firms engaged in the work, also serve to illustrate many of the references made to them. The Rembrandt Intaglio Company's colour print is notable as being the first example of their process used for book illustration. Messrs. Carl Hentschel, Ltd., who have done pioneer work in developing the three-colour process, show a good example of their "Colortype" method, which has been largely used for the illustration of numerous high-class art books issued during the last few years. Messrs. André & Sleigh, Ltd., who have also done a vast amount of fine book illustration by the three-colour block process, and have made a speciality of reproducing the pictures in our national galleries, contribute a specimen of their new "screenless" process, which may almost be described as the "last word" in three-colour reproduction. Messrs. John Swain & Son's reproduction of a portrait is a notable result by a firm who have had a large part in successfully developing the process of three-colour block making and printing. The Press Etching Co.'s specimen of their "Prescoltint" process is interesting as an example of skilful handwork on a photographic basis, and combining both grain and half-tone dot plates. The plate by Mr. C. G. Zander's "Complementary" Colour Process illustrates more forcibly than the printed description the features of his method. The charming little print by the London County Council School of Photo-engraving and Lithography not only demonstrates the success of the teaching, but also shows the possibility of printing on a pure rag paper instead of the highly surfaced chalk-coated papers commonly used for half-tone printing. The Half-Tone Co.'s four-colour reproduction of one of the coloured prints in Savage's book is a characteristic example of the possibilities of the process. The three-colour reproduction in the

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" Metzograph " grain, from the Process Studios of Geo. Newnes, Ltd., is a welcome contribution, as showing a distinctly new style of treatment, which has great promise. Messrs. Bemrose & Sons, Ltd., Derby, and Messrs. Taylor Bros., Leeds, each show distinct styles of multi-colour printing, which are most valuable for comparative purposes. Other examples of three-colour printing have been contributed by Messrs. Macfarlane & Erskine, and Messrs. J. J. Waddington, Ltd.; also one in four colours by the Graphic Photo-Engraving Company. These are of interest as being modern reproductions of old coloured pictures. In the case of the portrait of Guido Reni, it was thought desirable—the original itself being in three colours—to show the print in its successive stages of reproduction by the modern three-colour process, thus furnishing what the writer believes to be a unique series of pictures of this kind ; they have been printed at the publishers' own establishment. The stages are: (1) first colour, (2) second colour, (3) second colour on first, and (4) third colour, the printing of which on (3) produces the finished picture. Outdoor colour-screen photography, in connection with the three-colour printing method, has not hitherto been much practised, owing to inherent difficulties, but an example by the Marshall Engraving Co. is included in this volume. The Arc Engraving Co., Ltd., who, in 1897, were the first to attempt working the " direct " three-colour process with collodion emulsion, show a good example of their recent work. A characteristic example of everyday work in chromo-lithography by the new " Offset " process is provided by Messrs. Geo. Mann & Co., and an excellent specimen of colour work direct from the stone has been supplied by Messrs. McCaw, Stevenson & Orr, Ltd. Collotype in colours is a process very seldom operated in this country, and therefore the example of this class of work that is contributed by Messrs. W. & T. Gaines will be of interest. Letterpress colour-printing from type is well exemplified by the old-style specimen sent by Messrs. Geo. Falkner & Co.

Finally, we have to tender our thanks to the London County

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PREFACE

Council School of Photo-engraving and Lithography for the loan of the black-and-white initial blocks for the chapters, with the exception of that for Chapter X, which was designed and engraved by the Photo-Process Dept. of the Municipal School of Technology, Manchester.

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CONTENTS

CHAP.		PAGE
	PREFACE	v
I.	COLOUR PRINTING IN THE FIFTEENTH CENTURY .	1
II.	COLOUR PRINTING IN THE SIXTEENTH AND SEVENTEENTH CENTURIES	13
III.	COLOUR PRINTING IN THE EIGHTEENTH CENTURY. SECTION I: LE BLON'S THREE-COLOUR PROCESS—THE LATER WORKERS IN CHIAROSCURO . .	49
IV.	COLOUR PRINTING IN THE EIGHTEENTH CENTURY. SECTION II: INTAGLIO PRINTING PROCESSES—STIPPLE, AQUATINT, ETC.	82
V.	COLOUR PRINTING IN THE NINETEENTH CENTURY—CHROMO-XYLOGRAPHY. SECTION I: SAVAGE AND HIS "DECORATIVE PRINTING"—BAXTER, HIS LICENSEES AND HIS RIVALS—THE CHISWICK PRESS . .	115
VI.	COLOUR PRINTING IN THE NINETEENTH CENTURY—CHROMO-XYLOGRAPHY. SECTION II: KNIGHT, LEIGHTON, VIZETELLY, EVANS, FAWCETT, SILBERMANN, THE KNÖFLERS, HODSON, ETC. . . .	141
VII.	CHROMO-LITHOGRAPHY. SECTION I: FROM THE INVENTION OF THE ART TO 1850 . . .	174
VIII.	CHROMO-LITHOGRAPHY. SECTION II: FROM THE EXHIBITION OF 1851 TO THE PRESENT DAY . .	199
IX.	PHOTO-MECHANICAL COLOUR PRINTING—COLOUR ETCHING	220
X.	MODERN COLOUR PROCESSES. BY W. GAMBLE, EDITOR OF THE "PROCESS YEAR BOOK" . . .	253
	INDEX	275

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LIST OF ILLUSTRATIONS

HALF TONES

	PAGE
GEORGE BAXTER	124
KEY PLATE OF BAXTER'S "HOLLYHOCKS"	126
GEO. C. LEIGHTON	146
BENJAMIN FAWCETT	160
RUDOLF KNÖFLER—HEINRICH KNÖFLER	166
GODEFROI ENGELMANN	180
OWEN JONES—CHAS. JOSEPH HULLMANDEL	182
MICHAEL HANHART—WILLIAM DAY	196

COLOUR PRINTS

CHIAROSCURO PRINT BY J. SKIFFE	*Frontispiece*
THE ADORATION OF THE MAGI: CHIAROSCURO BY UGO DA CARPI	22
PORTRAIT OF A MAN: LINE ENGRAVING IN COLOURS BY J. TEYLER	46
PORTRAIT OF GUIDO RENI: THREE-COLOUR MEZZOTINT BY LASINIO	64
LANDSCAPE FROM SAVAGE'S "DECORATIVE PRINTING"	118
BAXTER PROCESS PRINT	136
WOOD-BLOCK PRINT AFTER KATE GREENAWAY	156
LETTERPRESS PRINTING IN COLOURS FROM TYPE	164
CHROMO-LITHOGRAPH	210
A CONFERENCE IN THE SIXTEENTH CENTURY: MEZZOCHROME PHOTOGRAVURE IN COLOURS	224
COLLOTYPE IN COLOURS	228
THREE-COLOUR PRINT: THE LADY HILDEGARDE	230
THREE-COLOUR PRINT, COPY OF AN OLD MASTER	234
PRESCOLTINT PRINT	236
THREE-COLOUR PRINT BY "COLOURTYPE" PROCESS	238
THREE-COLOUR PRINT ON RAG PAPER	240
THREE-COLOUR PRINT BY OUTDOOR PHOTOGRAPHY	244
THREE-COLOUR PRINT FROM AUTOCHROME PLATES	254
"THE HOLY FAMILY": FOUR-COLOUR PRINT	258
SCREENLESS THREE-COLOUR PROCESS PRINT	260
ZANDER'S FOUR-COLOUR PROCESS PRINT	262
METZOGRAPH THREE-COLOUR PROCESS PRINT	264
CHROMO-LITHOGRAPH BY "OFFSET" METHOD	266

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Colour Printing and Colour Printers

CHAPTER I

COLOUR PRINTING IN THE FIFTEENTH CENTURY

PRINTING in colours almost certainly had its origin in attempts to imitate by mechanical means, though to a very limited extent, the colour decoration of the MSS. which furnished the text for the earliest printed books.

It is scarcely necessary to point out that in the ages before the invention of printing all books were in manuscript, either on paper or vellum, and that in many cases—particularly as regards devotional works—the text of the MS. was illustrated by decorative initials, borders or other paintings in colours, which were frequently of a high order of merit. When letterpress printing first began to be practised, say in the middle of the fifteenth century, the printers took the MSS. as their models, and the type-cutters imitated the lettering of the scribes. These latter, as a rule, only executed the text of a book, leaving the initials, borders, pictures and decorative accessories to be filled in by other hands, those of the rubricators and the miniature-painters. The earliest printers apparently felt unequal to the task of imitating these by impressions from relief surfaces, and so, like the contemporary scribes, contented themselves with printing the text of a

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work, the initials, borders, etc., being afterwards painted by hand, as in the MSS. But within a very short time after the death of Gutenberg in 1468, woodcut initials, borders and illustrations made their appearance. They were nearly all in outline, and frequently rather hard and crude in effect when compared with the hand-painted work seen in the MSS. or the earliest printed books. This was also the case with what are known as the " Block Books," in which both picture and explanatory text was engraved together, a single wood block thus serving for each page, and furnishing the distinctive title since given to the books themselves. Most of these were evidently contemporary with the early movable-type printed books, and yet the producers of the latter were several years in evolving the idea of combining the two styles, so as to produce a type-printed book with woodcut illustrations. Although the art of letterpress printing almost certainly took its rise, so far as Europe is concerned, in the first half of the fifteenth century—when and where is still quite unknown, in spite of the multitude of books that have been written on the subject—no extant dated examples have been cited earlier than 1454, in the latter part of which year the first issue of the well-known *Letter of Indulgence* was got out, presumably from the press of Johan Gutenberg, the supposed inventor of printing, at Mainz.

It is probable that the " Indulgences " were preceded by at least some of the Block Books, which are usually looked upon as being the forerunners of books printed from movable type, but this is a point which is likewise uncertain. Still, it will do no harm to accept the general opinion on the subject, and we may therefore select the era of their production, whatever that was, as a starting point for our history, seeing that colour printing of a kind was carried out in the case of a few of these Block Books (such as the *Ars Moriendi* of *c.* 1450), which are printed in a sort of watery-brown or bistre tint. The pictorial effect, whether black or brown ink were used, was, when compared with the beautiful coloured designs of the

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professional miniature-painters, bald and dreary in the extreme, and some of the purchasers of the volumes evidently thought so, many of those that remain having the illustrations coloured by hand. The printing was done on one side of the paper only, two sheets being pasted together back to back, to form a leaf of the book itself. It is doubtful whether any press was used in printing them, the general opinion being that the wood block was inked, the paper placed upon the wet engraved surface, and rubbed with the hand or a cloth, in order to produce an impression, much in the same way as coloured prints are to this day produced in Japan. The hand-colouring of book illustrations was very commonly practised during the latter part of the fifteenth century. Prior to about 1480, manuscripts—even the more costly painted and illuminated ones—were many, and illustrated printed books few, so that the book-buying public of the third quarter of the fifteenth century was not accustomed to, and did not much appreciate, the crudity of the decorative elements of the latter. The printers of that time could not fail to have been aware of the partiality generally displayed for that colouring to which book readers and buyers had so long been used, and there is evidence that a few of them, at least, endeavoured to supply what their productions lacked in this respect.

The commonest form of colour printing is that in which red and black inks are used for the text of a book, and typical examples of it may be seen in, for instance, some editions of the *Book of Common Prayer* of the Church of England, where the rubrics, or directions to the officiating minister and his congregation—as distinguished from the prayers themselves—are printed in red, *i.e.*, " rubricated " (from the Latin *ruber*, red), the rest of the text being in black. The practice of distinguishing passages of this kind, chapter or page headings and the like, by writing or marking them in red, dates from very early times, and another, equally ancient, was that of making the initial letters of the first words of chapters, and other divisions of a work, much larger, and of a different

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colour from the body of the text. Both these usages of the scribes were common at the time when typography was introduced, and the earliest essays towards colour printing proper seem to have been directed to imitating them, as was pointed out in the commencement of this chapter. The first printed book which has what is considered an authentic—though not a printed—date is the 42-line "Mazarin" Bible, supposed to have been produced by Gutenberg at Mainz not later than 1456, as one of the existing copies contains the written date of August 15th in that year, being the day on which the rubricator, who filled in the initials, etc., by hand, finished his task in one of the volumes. The earlier sheets of this Bible have headings and initials printed in red, but as the work progressed this practice was abandoned, and the spaces left blank for the rubricator to deal with.

The next development of colour printing was on a more ambitious scale, and occurs in the Liturgical Psalter printed by Fust and Schoeffer at Mainz, in August, 1457, the first printed book to bear a genuine printed date, which, it may be noted, is just a year later than that which occurs in the Bible already alluded to. The text of this Psalter is in a very large Gothic type, printed in red and black. It also has a series of large decorative initials in two colours, red and blue. There has been much controversy as to the manner in which these were produced, one theory being that they were stamped in by hand in blank spaces left for them in the printed page, whilst another is that there was a separate block for each colour, and that they were inked, fitted together, and placed in a space left for them in the forme of type, which had previously been inked in black. A second edition of the Psalter was published in 1459, and between the two (*i.e.*, in 1458) a Canon of the Mass appears to have been got out, some fragments of which are preserved in the Bodleian Library at Oxford. It has the text in red and black, and is decorated with large and small two-colour initials, in a similar manner to the Psalters, red, blue and purple being the colours used. Whatever

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may have been the case with regard to the large initials, there seems no reason to doubt that the rubricated passages in the text were produced by a second printing, the type for the red ink being made up separately from that intended to be inked in black. In one page of the Canon the large initial has not been printed at all, and the word printed in red close by is upside down, defects that are evidently the result of some carelessness on the part of the maker-up or the pressman. There are, however, extant evidences which go to prove that another method of working these two-colour jobs was tried, probably about the same time. These are to be found in an undated *Missale Speciale* in the possession of a Munich bookseller, which some authorities consider was produced before the Psalter of 1457, or even prior to 1450. In this case it is almost certain that there was only one forme of type for each page, the passages intended to be printed in red being made up in their proper places along with the text to be printed in black, and inked apart from the latter, which was possibly covered over during the operation. Naturally the red ink occasionally got rubbed on projecting portions of the " black " letters, and *vice versa*, and this not having been noticed by the pressman, the defects were perpetuated on the printed page, and thus show the method adopted by the man who inked the forme. In 1459 the *Rationale Divinorum Officiorum* of G. Durandus was produced by Fust & Schoeffer. This contains a series of initials in two colours in the style of the Psalters, of which the actual letter is nearly always red, the attached ornament being as a rule in one of several shades of greyish-blue. The text commences with a very large initial Q, also printed in two colours. It seems likely that these large decorative initials in Fust & Schoeffer's earliest books were printed or stamped on the page before the text, and that the actual letter was printed first, and the surrounding ornament added subsequently. Mr. Weale thinks the letters were stencilled, but his argument is not particularly convincing. Moreover the outlines of many of them form complete rings of colour, and it is not easy to conceive that

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these could be the product of stencilling. The Latin Bible printed at Mainz by Fust & Schoeffer in 1462 (the second volume of which is dated August 14th, exactly five years after the first dated Psalter) has a colophon—or statement of the date and place of printing, with the name of the printer—of several lines, printed in red, followed by the device of those typographers, a double shield, likewise in red. The volumes have also some headings printed in red.

Colour printing was essayed in Italy, England and France before the end of the fifteenth century, in the order in which those countries are named. From 1469 onwards, Venice was the Italian Metropolis of printing. In 1476 a press was started there by three Germans, one of whom (he had the business in his own hands in 1478) was Ehrhard Ratdolt, who came from the Bavarian city of Augsburg, where printing was begun as early as 1468. He seems to have been one of the most skilled and enterprising printers of the age, and many of his books rank, in typographical importance, with those of the still more famous Venetian printer, Nicolas Jenson. Ratdolt is especially celebrated for the amount of decorative and illustrative work that he introduced into his books, in the form of woodcuts, ornamental borders, initials and diagrams. It was in connection with these latter that he seems to have made his first experiment in colour printing, the work selected being the thirteenth century astronomical treatise of John Holywood (better known by the Latin translation of his name, "Sacrobosco"), supposed to have been a native of Halifax. Ratdolt issued his first edition of the work in July, 1482; it was a small 4to volume of sixty folios, and had nearly forty diagrams, generally about half the size of the page, nine of which, as being the most important, were coloured, but by hand. Subsequently it seems to have occurred to Ratdolt that these principal diagrams, which consisted merely of outlines, might be coloured by the press. At any rate, he got out another edition of the book in 1485, in which seven of the thirty-two half-page cuts it contained were printed in colours, six

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of them in yellow or drab and black, and one in red, yellow and black. The novelty of the thing perhaps appealed to book-buyers, with the result that fresh editions of the work, decorated in a similar manner, were called for. A second one came out in the Spring of 1488, from the press of Hieronimus de Sanctis and Santritter, at Venice, seven of the diagrams being printed in two, and one of them in three colours. Ratdolt's material, and perhaps his pressman, was probably employed (he himself had returned to Augsburg in 1486) as the colour work is of similar character, and some of the ornamental woodcut initials apparently identical. A third edition of the work was published at Venice in October, 1490, by O. Scotus, the printer being—according to the colophon—B. Locatellus. The colour printing is on the same lines as before, six diagrams being in one colour and black, and one in two colours and black. Some of the blocks used in this edition had previously been in the possession of the printer of the preceding one, H. de Sanctis, so that there was evidently some connection between them, which may account for the similarity of their colour work.

What is generally regarded as an edition pirated from the last two was produced by another Venetian printer, G. de Tridino, early in 1491. The same seven diagrams were in colours, but in this instance the printers, either from want of skill or from a desire to save trouble, stencilled the tints in place of working them on the press. Proof of this is afforded by the fact that the " ties " which united the cut-out parts of the stencils with the body of the plates, and of course produced uncoloured spaces, show in the prints as white lines. Ottley, one of the historians of wood engraving, was of opinion that a similar stencilling process was used in applying the colours to the earliest extant specimens of playing-cards, which are generally referred to the latter part of the fifteenth century.

One other example of Venetian colour printing may be noticed before we turn to the work of our own country in that

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line. It occurs in a book printed by John Herzog in 1490, the *Repetitis Tituli* of J. Crispus de Montibus, and consists of a double-page genealogical chart of the Tree of Affinity, etc., tinted in red, brown and green, though this last colour, which is applied to the leaves of the trees, may have been stencilled.

Herzog had several earlier local examples to guide him in his work, but where the first English colour printer obtained his inspiration from is a matter of mystery, seeing that neither Caxton or any other printer in England in that day did anything of the kind, and apart from the Psalters of a quarter-of-a-century before nothing in the way of colour work seems to have been previously attempted on the Continent, save that produced by Ratdolt in 1485, which was hardly likely to have come immediately under the notice of a man in a small English town. The earliest examples of colour printing in England occur in the last two books issued by the "Schoolmaster Printer" at St. Albans, in 1483 (?) and 1486 respectively. This is a fact that escaped notice until quite lately, none of the bibliographers who described the productions of the first St. Albans press having apparently realised the historical importance of the colour work the last two of them contained. In the earlier, the *St. Albans Chronicle*, the initials are printed throughout in red, contrary to the usual practice of inserting them by hand, but in the treatise on Coat Armour in the so-called Book of St. Albans, the printer attempted much higher flights. This work is illustrated by a large number of heraldic shields, printed in their proper colours, of which sometimes two or three occur together on the same shield. Considering the rude nature of the appliances then in use, the press work is fairly well done, and the register maintained between the different colours is usually good. Red, blue and brown were used, in addition to the common black, the yellow that appears on some of the shields being most likely added by hand. The same tints were also used in printing the initials throughout the book. The identity of the Schoolmaster is quite unknown; he seems to have been at work in the

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Hertfordshire town as early as 1480. But whoever he was, the St. Albans printer was evidently a man of originality and enterprise, and his colour work deserves far more attention than it has hitherto received. After his time, English colour printing, for more than two centuries, was practically confined to the ordinary black and red, though there was but little of the latter colour seen after the Reformation had done away with the picturesque two-colour service books of the Roman Church.

A very interesting example of colour printing occurs in a Horæ of the B.V.M., printed by Jean du Pré at Paris in 1490, a small octavo volume which is unique of its kind. Like all the early Horæ, it is profusely illustrated, and the cuts, borders and decorative initials are printed in colours, or more properly speaking in some one colour other than black, green, brown and red being the tints used. A large cut was usually surrounded by several smaller ones, forming a sort of border, and generally the cut is in one colour and the border in a different one, or some of the pieces composing the border may be in one colour, and the rest in another, making two or three colours on the page. In one or two cases, the blocks were all locked up together, and inked separately in the required tints, the page being then printed at one impression, but as this led to colour intended for one block getting on the margin of the one next to it, the practice was abandoned in the later pages in favour of the usual one of working each colour separately. A *Liber Meditationum*, printed in Paris by Claude Jaumer at the close of the century, has the title-page, a four-piece ornamental border enclosing a cut of the Crucifixion, with lettering above, wholly in red. A Spanish example of colour printing of similar character is seen in Palentia's *Vocabulario*, printed at Seville by Pedro de Colonia in 1490. The last printed page but one is wholly in red. The colophon, in small Gothic type, is at the top, and beneath is a very large device of the printer, with white outlines on a solid ground. The style suggests that Peter went from Cologne to Spain viâ Italy.

It may be mentioned that Ratdolt, the Venetian printer

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just alluded to, also experimented in the direction of printing in gold, although its use was confined to a dedicatory address —like that to the Doge John Mocenico in the *Euclid* of 1482— in a special copy, intended for presentation to the patron under whose auspices a particular work had been issued. He was, in fact, a pioneer in many branches of colour printing, and continued his work in that line after his return to Augsburg in 1486. His *Obsequiale Augustanum* of 1487 has as a frontispiece a woodcut portrait of Bishop Friedrich von Hohenzollern, with the arms of the see printed in black and coloured in red and bistre by two tone blocks. In 1489 Ratdolt brought out the *Compilatio de astrorum Scientia* of Leopold, son of the Duke of Austria. This is a quarto volume, containing numerous woodcuts, three of which are sometimes found printed in colours. The British Museum copy contains only one, on folio b ii, in which two concentric circles printed in red are separated by a ring of white. The Augsburg Missal of 1491 has the Crucifixion plate, which faces the Canon of the Mass, printed in black and tinted in red, blue, green and yellow from four other blocks, or perhaps with the aid of stencils. The Brescia Missal of 1493, the Padua Missal of 1494, and the Passau Missals of 1494 and 1498, have similar illustrations, coloured in the same style, as well as some large two-colour initials and the arms of the see in red and black, though the treatment may vary in different copies. The Augsburg Breviary of 1495, like one Ratdolt got out in Venice ten years before, has a cut of the arms of the see on the back of the title, printed in red and black. The Ratisbon Missal of 1496 has a full-page woodcut of the Patron of the Church as a frontispiece, with the arms of the see below, printed in black and red, some yellow being added in places by hand. In 1499 Ratdolt republished the *Calendarium* of Regiomontanus, in which is a number of two-colour circular diagrams of the phases of the moon, printed in red and black. An edition of this work, illustrated in a similar style by twenty-one such diagrams, had been issued at Venice in 1482 by J. L. Santritter.

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Limited as his colour printing, and that of the fifteenth century in general was, it must be remembered that Ratdolt and his competitors were exercising a comparatively new art, carried on with the aid of very crude mechanical appliances, and poor though the colour work of these old typographers seems, when judged by present-day standards, we must not forget that they were as men feeling their way, amidst the as yet imperfectly understood intricacies of an industry whose great possibilities were probably undreamt of in those days. There seems no reason to doubt that all this fifteenth century colour printing was done with wood blocks, although in ordinary black-on-white printing, engravings on metal were in occasional use.

Owing to the preference then shown for the colouring of the illustrations and other decorative parts of a book, the results of the pressmen's crude efforts at colour printing were sometimes supplemented by hand work, to such an extent that it is often difficult to say where one process leaves off and the other begins. By the close of the century, millions of printed books had been put into circulation, and the public being thus thoroughly familiarised with them, and becoming more and more forgetful of their earlier MS. predecessors, ceased to call for their colour ornamentation to so large an extent as formerly, and thus printing in colour, other than in red from type, printers' devices, head and tail pieces, etc., came practically to be abandoned. As regards this latter branch, it is remarkable, considering the primitive nature of the appliances then in use, what exact register was usually maintained between the red and black passages in the text of a book, even in cases where the colour changes two or three times in the same line.

All the examples of colour printing that have been mentioned hitherto were produced in connection with printed books, and it is very doubtful whether any separate pictures, printed in colours, were produced at this period. An exception may perhaps be made in favour of religious prints, and

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one example of this kind was included in the Schreiber collection, sold at Vienna last year. This was a print of St. Anthony of Padua, about 13 × 10 inches, possibly of Spanish origin. The colours used were dark violet, bluish-green, grey and red, and it is considered that they were partly printed, and partly applied from stencils. This print is attributed to the close of the century, and Prof. Schreiber held it to be perhaps the oldest coloured woodcut in existence. The same collection also included a print in silver, from a wood or metal surface, of the Virgin of Loretto, on a piece of silk, which was considered to be of Italian origin, and to likewise date from the end of the fifteenth century. A still more interesting example of the same period, but of German origin, was a print on vellum, 10 × 6½ inches, representing Christ on the Cross, with Mary and John. The outline was coloured by four tone plates, viz.: red, blue, yellow and green. It was probably intended for use in some liturgical volume, to face the opening page of the Canon of the Mass.

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CHAPTER II

COLOUR PRINTING IN THE SIXTEENTH AND SEVENTEENTH CENTURIES

HE previous chapter dealt with isolated and mostly unconnected essays at printing in colours, nearly all of which were obviously in the nature of experiments. Those who carried them out probably felt that the time and trouble bestowed upon them were not compensated for by the result, and hence printers and booksellers discontinued this class of work in favour of the old method of hand-colouring. So far, however, as printed books in general were concerned, even this, from the commencement of the sixteenth century, was to all intents and purposes confined to the beautiful Horæ and other devotional and liturgical works issued so profusely from Parisian presses. The illustrations in these, generally full-page wood-cuts or engravings on soft metal, were often completely covered by a blaze of brilliant colour, frequently heightened by gold, and the hopelessness of attempting to rival these effects by press work no doubt led to the virtual disuse of colour printing of the decorative order. Colour printing experiments were, it is true, still made from time to time, and some of them will be referred to presently, but from the colour printer's point of view the early part of the sixteenth century is chiefly remarkable as the period when the art of printing pictures in colours took its rise, an art which is still practised on much the same lines, though to a very limited extent, at the present day.

The method here alluded to is that which has always been known by its Italian name of " Chiaroscuro." This term was

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that used by the printers themselves, as it occurs in Ugo da Carpi's petition, and means literally "clear-obscure." What was intended to be conveyed by it was no doubt the fact that in a picture of this character the lights and shadows are distributed to give effect to the composition, and so in the prints the varying effects of light and shade are represented, not by lines or cross-hatching, as in an ordinary engraving on wood or metal, but by tones, in the shape of broad masses of colour, produced by surface-printing from wood blocks; these, however, were not intended to stand by themselves, but were applied for the purpose of colouring an outline woodcut. A chiaroscuro effect can, of course, be produced (as in aquatinting) by the tones alone, without the aid of any outlines, but this method was hardly ever followed by the early chiaroscurists.

At the time when this branch of art had its birth, its exponents were contemporary with some of the great masters of painting and drawing, such as Cranach, Burgmair, Raphael, Parmegiano, Titian, etc., and their compositions frequently served as models, particularly in Italy. But there was this distinction, that whereas these men were not merely designers, but brilliant colourists as well, the chiaroscuro artist made no attempt to represent scenes or objects in their natural colours. Later workers in the same field, like Savage, Baxter, and Knight, did achieve this, but prior to the nineteenth century, practically all the chiaroscurists were content to make use of sombre neutral tints. Their range of colours was thus not a very wide one, comprising only olive-green, reddish-brown, dark brick red, and pale yellow. These, with sepia, and—rarely—a greyish-blue, seem to have been all that were used. The colouring base was evidently mixed with oil, which has in some cases penetrated the paper to such an extent that an impression of the picture in reverse can be seen on the back of the print. Some blocks, by the way, were actually engraved with a design in reverse. The prints were produced with great pressure, were almost embossed, in fact, so that in some

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instances a cast could be taken from the deeply sunk outlines of the design.

In this connection it may be mentioned that the wooden press of the fifteenth century, which is represented in a Lyons woodcut of 1499, remained practically unaltered until the early part of the seventeenth century, when it was improved by Blaeu of Amsterdam. Further improvements, embodying the use of metal parts, were made by Annisson du Perron, of Paris, and others, towards the end of the eighteenth century, but it was not until 1800 that the first iron press (the "Stanhope," invented by Earl Stanhope) came into use. All the books, and most of the prints, which are mentioned in this and several succeeding chapters, were therefore produced by an apparatus which was much on the lines of the ordinary letter-copying press, save that the spindle with the screw, in place of being attached to the middle of the bar or handle, was fastened to one end of it, the other being left free for the pressman to pull over. As great pressure was applied to the platen in this way, the upper part of the press was often stayed to the ceiling above, in order to prevent it flying to pieces under the strain. It is scarcely necessary to remark that all the paper in use prior to the nineteenth century was made by hand, and until the latter part of the eighteenth century was of the same kind, *i.e.*, "laid," that is, the wires of the mould were laid in position by hand, instead of being woven into a more or less flexible fabric in a loom. When the wire marks in a sheet of paper were deep, the effect of applying masses of colour to the surface was that the channels forming the marks were filled with ink, thus giving the ribbed appearance often seen in prints of the kind under notice. The use of coloured paper for a print, in place of printing a coloured background on white paper, seems to have been very seldom resorted to. The writer has seen only one early instance, *i.e.*, a copy of Ugo's "St. John the Baptist," which is printed on thin brown paper, only one tone block (yellow) being used in addition to the outline woodcut.

Who first produced prints in chiaroscuro is not known with

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absolute certainty. The older writers on wood engraving generally concurred in giving the credit of the invention to Ugo da Carpi, an Italian. Hardly anything is known concerning this personage, not even the dates of his birth and death, though he is said to have been of noble descent, and is usually considered to have been a painter of average merit but obscure fame, who flourished from about 1450 to 1520. He was working the process in Venice in 1516, as in that year he petitioned the Senate of that city—which seems to have been the birthplace of copyright privileges—for protection against other artists who were producing prints by the chiaroscuro method, of which he alleged he was the inventor. So far as Italy was concerned, he was no doubt responsible for the introduction of the process, but in other respects was only a copyist himself. Ugo's petition was heard, and granted, on July 24th, and set out that he had been a long time in the city, and had discovered a new, useful, and beautiful way of printing in chiaroscuro (*trovato modo nuovo di stampare chiaro et scuro, cosa nova . . . et bella . . . et utile*), and being in the habit of engraving in this way, which had never been thought of before by any other person, he requested the Senate to order that no one should counterfeit any of his designs or engravings, under pain of confiscation and a fine of 10 ducats for each such counterfeited impression, which fine was, as usual in such cases, divided into three parts, one for the poor, the second for the Judge who dealt with the case, and the third for the accuser, *i.e.*, Ugo, who described himself as "*intagliador de figure de legno.*" The entry on the Register of Venice is quoted in full by Gualadani in his *Di Ugo da Carpi* (1854), and the same writer enumerates fifty prints attributed to Carpi, who is supposed to have ended his days at Rome.

Bartsch, in his *Peintre Graveur* (1811) contested the idea that Ugo was the inventor of the chiaroscuro method, preferring instead to think that the Germans had the priority, which is almost certainly the case. The writer of the notice of Jost de Necker, in the last edition (1904) of Bryan's *Dictionary*

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of Painters and Engravers, says, indeed, without qualification, that Jost invented the process, but the statement probably has no other foundation than the fact that a print of this sort, dated 1510, was produced by him. There are, however, others with dates still earlier, as will be seen. The art of producing pictures in the chiaroscuro manner was evidently a development from hand-colouring. A print by a German artist named Mair, of Landshut (fl. 1492-1514) dated 1499, was long considered to be the earliest known in the chiaroscuro style, but Ottley and others have pointed out that it is really only an impression in black of an ordinary woodcut, on green paper, with the lights indicated by hand. Durer's work does not seem to have been much reproduced in the chiaroscuro style, although his large portrait of Ulrich Varnbuler, 1522, was republished, with the addition of tone plates, by some Dutchman in the seventeenth century, and an impression in this form may be seen at the British Museum. A picture of a rhinoceros, engraved by Durer in 1515, was copied at Antwerp, and published there the same year, tinted in the chiaroscuro manner, by H. Liefrinck (Bartsch, vii, 147, 36). Some of Durer's original drawings, however, distinctly suggest chiaroscuro work, such, for example, as the " Head of a Young Woman," which stands out against a pinkish background, with the lights put in in white, and the " Head of a Young Child," 1517. His " Study of a Naked Man," 1526, and the " Study of a Nude Woman," with the doubtful date of 1500, have slight greenish backgrounds with serrated edges, suggestive of lights on chiaroscuro lines. This sort of thing was practised at a much later period, as a woodcut of the Virgin in the Schreiber collection, by Francisco Dentato, who worked at Venice in 1540-50, was printed in a dark brown tone, with the lights indicated by hand.

What name was originally given to this class of work in Germany is not known, the present one, " clair-obscur," being obviously only a rendering of the Italian term. The earliest chiaroscuro print mentioned by Bartsch, in support of his theory that the Germans were the first to exploit this phase

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of art, is Lucas Cranach's " Repose in Egypt," dated 1509 (B. vii, 279, 3). This artist lived, mostly at Wittenberg, from 1472 to 1553, and held the appointment of Court Painter to the House of Saxony. The fact that the black or outline block of a chiaroscuro print bears a particular date is not, however, evidence that the tinted impressions are contemporary with it. A few years may have elapsed between the one and the other. The prevalent tone of the German chiaroscuros is brown, and although it is impossible to lay down a hard and fast rule, it may be said that this colour distinguishes most of the early German work (also some of the later Dutch and French) as opposed to the greenish tone common to the Italian prints. Not more than one or two tone blocks were used at first, the Cranach print just alluded to having only one. A " Venus " by the same artist is dated 1506 on the black block, being thus probably the oldest dated print of this character, although the coloured impression (tinted in brown, as usual), may not have appeared until 1509 or later. Cranach's woodcut of " St. Christopher " is in three states in the British Museum copies, the earliest in a greyish tone, the two later in different shades of brown. A very fine and unusual example is the print of an armed man on horseback, in which the black impression is coloured from two tone blocks, one in dark blue and the other in gold.

Contemporary with Cranach were several other German artists who engraved in chiaroscuro. Prominent among these is Hans Baldung (1475-1545) who worked chiefly at Strasburg. He produced a chiaroscuro print of " An Incantation " as early as 1510, which Bartsch mentions under " Grun "—supposed to have been a sort of nickname for this artist (B. vii, 319, 55). It is a large print, about 16 × 12 inches, tinted with light sepia, or—in another state—in brown. Baldung's " Adam and Eve " is a very fine example of the style (B. vii, 306, 3), of about the same size, and printed on a brownish paper, which thus imparts one tone, whilst a second is supplied from a block printed in a brownish shade. Another woodcut by Baldung, dated 1512, was produced in black on brown paper.

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EARLY GERMAN CHIAROSCURO WORK

Jost de Necker, the alleged inventor of chiaroscuro, was a native of Antwerp, but went to Germany and settled about 1510 at Augsburg, where was also the residence of that well-known painter and engraver, Hans Burgmair (1473-15—). Jost died in 1561. Two at least of his colour prints after Burgmair are dated, on the black or outline block, 1508. One is an impression, tinted in red, of the " St. George " (B. vii, 208, 23), but in another impression, in a green-grey tone, the outline cut bears no date. A still better known picture is that of the Emperor of Germany (Maximilian I) represented on horseback in full armour (B. vii, 211, 32). The original date on the outline block, 1508, appears without the " 0 " in a reddish-brown impression in chiaroscuro, but in a later one the date re-appears as 1518. In the former the name, " J. de Necker," is printed in black at the bottom of the print. In still another state, only represented at the British Museum by a reproduction, the tone block was printed in gold, in the style of the Cranach print already mentioned. In another engraving after Burgmair, which contains some architectural detail (B. vii, 215, 40) tones were printed over the woodcut in light brown and purplish grey; in a second state, the brown was discarded for yellow, and the purplish tone for a green shade; whilst in a third variety, more pronounced shades of green and yellow were used. There was very little detail in the outline cut for this print, and a copy in the Heseltine collection, dated 1510, is printed in three shades of grey only. Burgmair's fine portrait of Pope Julius II (1511)—a circular print of about 9 inches diameter (B. vii, 212, 33)—exists at the British Museum, in the chiaroscuro state, only in a reproduction by the Royal Printing Office at Berlin. The grey tone block greatly supplements the lights and details of the original woodcut. A still finer portrait by Burgmair is that of J. Baumgartner, 1512 (B. vii, 212, 34). Jost's work on this is in tones of greenish grey, and his blocks furnish most of the detail in the picture, the original woodcut giving little more than a bare outline.

Among other famous names in the annals of early sixteenth

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century German wood engraving is that of Albrecht Altdorfer of Ratisbon (? 1480-1538), who was also a painter and architect of considerable merit. Sixty-eight woodcuts are known to have been executed by him, and of these the most interesting from our point of view is No. 52 in the list given in Bryan: "Our Lady of Ratisbon," *c.* 1520. From the colour printer's standpoint this is, perhaps, the finest of all the early German prints in chiaroscuro. It is of large size, some 15 × 10 inches, with an ornamental border, and is in at least two states. The original impression preserved at the British Museum is somewhat "smudgy" in appearance, owing to imperfect inking and defective register. The black outline cut is coloured by no less than five tones, *i.e.*, two browns, a grey, a yellow and a blue. In a private collection at Berlin there is a copy of this print in different and brighter colours, viz.: red, blue, green, yellow and brown, thus constituting a distinct departure from the usual sombre tints of the artist in chiaroscuro.

Another early German worker in this branch of art was J. W. Wechtlin, sometimes known as "Pilgrim," a painter and wood engraver at Strasburg in the first half of the sixteenth century. One of his prints in chiaroscuro, "The Crucifixion," is in the usual greenish-grey shade, but like Altdorfer's "Virgin," has an ornamental border, which in this case is in four pieces. This border is also used on another print. An interesting chiaroscuro print of Wechtlin's is "The Virgin" (B. vii, 450, 2), printed in a greyish-blue tint, the tone block supplying much of the detail of the picture, such as the hills and clouds seen in the background. In another case, the "Pyrgo Teles" print, solid blacks occur in the otherwise cloudy background, which is printed in a greenish grey tone. In the "St. Stephen," the sides of the "Crucifixion" border are re-used, but the top and bottom are different. The "Skull" print (B. vii, 451, 6-7) is in two varieties of greenish grey, but in a third state (9) some of the detail in the background is different.

It is practically certain that the colours in chiaroscuro prints were applied by the press, and were not supplemented

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either by hand-colouring or by stencilling. This latter process, however, as being a sort of connecting link between hand and press colouring, demands a few words of notice. It seems to have been largely used in the sixteenth, seventeenth and eighteenth centuries for colouring playing-cards, and to a lesser extent for colouring prints and book illustrations. Among Jost Amman's cuts in Schopper's *Panoplia* (Frankfort, 1568), is one representing the "Briefmaler," a term which modern dictionaries render by "card-painter." The size and shape of the brush he is wielding leave no doubt that he is engaged in stencilling colour on the prints piled on the table at which he is seated. A well-known French print of the latter part of the seventeenth century, reproduced as the frontispiece to D'Allegmagne's *Les Cartes à jouer* (1906), shows the operations of stencilling in full detail, as carried on at a Parisian playing-card factory. So far as earlier practice is concerned, the *Cronica Cronicarium abrége* (Paris, 1521) furnishes an interesting example. The page is a very large one, measuring about 25 × 20 inches in its uncut state, and the work contains many circular portraits, 1½ inches diam., some small rectangular views of towns, 3 × 2 inches, and several genealogical trees. A multitude of small circular spaces, ¾-inch diam., enclosing the names of members of Royal Houses, etc., are coloured yellow throughout, and green and purple are used on the portraits and views. The nature of the work makes it almost certain that the colours were applied by stencils, although the red borders round the portraits must have been added, in part at any rate, by hand, as the circles are unbroken. The colours are somewhat muddy. Another Parisian book of Chronicle type (*Registre des Ans*, 1532) has, in some copies, the woodcuts—views of cities, portraits of kings, coats of arms, etc.—tinted in three or four colours in a similar manner, probably with the aid of stencils. A print of a German peasant woman by W. Drechsel (*c.* 1550) in the British Museum, has some colouring in parts in four or five tints, which were most likely stencilled. It may be of interest to point out that in a MS.

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in the British Museum, dated 1518, and concerned with certain imaginary dialogues between Francis I of France and Julius Cæsar, an artist—supposed to be one Godefroy—has executed some beautiful little miniatures in the style known as Camée-gris or grisaille. The outlines are drawn with pen and ink after the manner of a woodcut, and then tinted in the chiaro-scuro style in three shades of bluish grey, with the high lights left uncoloured (*i.e.*, white). The idea was probably derived from German work, and the colouring adapted to French notions of art.

We may now proceed to a consideration of Italian work in chiaroscuro, which may be regarded as following—as it was, indeed, no doubt copied from—the German in general style and method of treatment, though the colour scheme was usually different. The designs were in most cases furnished by the great masters directly to the engravers. Parmegiano, for instance, seems to have made a business of publishing his designs in chiaroscuro, employing men like Ugo and Antonio to do the actual engraving of the blocks. According to Bartsch, two chiaroscuro prints by Ugo da Carpi were dated 1518. A copy of one of these, the " Death of Ananias," is in the British Museum, although the lower part of the inscription, bearing the date, has been cut off. Of Ugo's work as a chiaroscurist we have, however, other evidence, in the brief inscription, " Ugo," which is found on some of his prints, or the longer ones, such as " Raphael Urbino per Ugo da Carpi," which occur on others. The number of tone blocks used on any one print is not large, two or three at the most, excluding the outline cut in black, and whilst the impressions of some of them constitute what the print collector terms " states," *i.e.*, show the picture in various stages of development, others demonstrate that it was a common practice to print the same block in different tones for successive copies of the picture. The high lights were rendered by either allowing patches of the white surface of the paper to show, or by printing a very faint tint from a block.

Another Italian worker in this field, contemporary with

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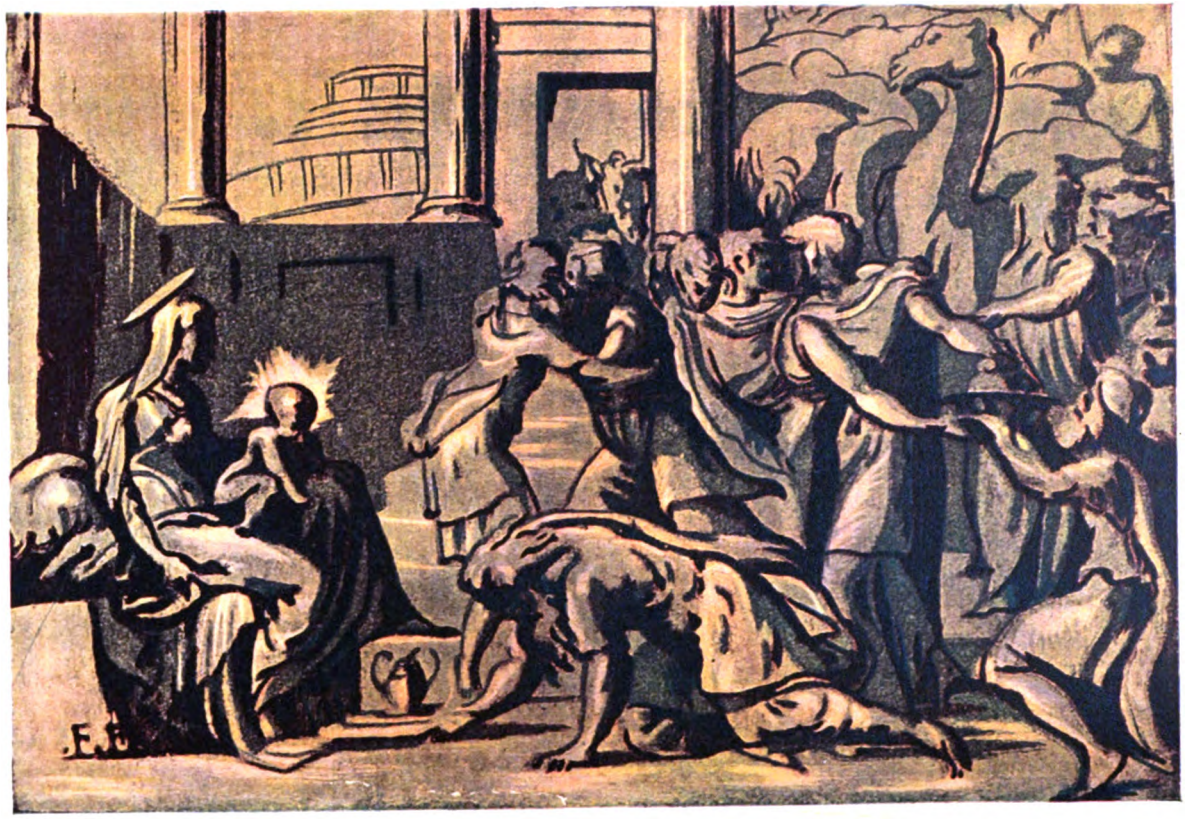

THE ADORATION OF THE MAGI

by F. Parmegiano

Reduced from facsimile of print in chiaroscuro by Ugo da Carpi, about 1520

Kindly printed by Messrs. McFarlane & Erskine.

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Ugo, was Antonio de Trento of Mantua (1508-?). He was a pupil of Parmegiano (Francesco Mazzola), and one day, about 1530, he was missing from that artist's studio, a number of drawings and sketches disappearing with him. A few years after, an artist began publishing etchings at Paris, executed in a style identical with that of Antonio, but bearing the name of Fantose. It is now generally assumed that the two are identical. Some two centuries later, a number of Parmegiano's designs, supposed to have been among those thus abstracted from his studio, were discovered by Count Zanetti (to be mentioned in the next chapter) amongst the collections of the Earl of Arundel, and were conveyed by him back to Italy, where they furnished material for his own productions in the chiaroscuro style. Antonio's prints are not very numerous, and are mostly distinguished by heavy black outlines. Many of them, like the " Circe," and " Christ in the House of Simon," were used again by Andreani some fifty years later; in these particular instances, in 1602 and 1609 respectively. From the time of the death of Ugo, or at any rate from that of the disappearance of Antonio, the art of printing pictures in the chiaroscuro style seems to have been discontinued in Italy, as in Germany, and was not revived in the former country until the time when we may assume that some of the old blocks were discovered, and preparations made to put the art in practice again, by Andreani.

Whatever views may be held with regard to the precise parts played by Ugo and Antonio on the chiaroscuro stage, there can be but little doubt respecting that of Andrea Andreani of Mantua (1560-1623), as a majority of the existing early Italian prints in chiaroscuro were, if not actually engraved, at any rate printed by him. Many of the suites of blocks engraved by the two older artists just mentioned seem to have found their way into his hands towards the close of the sixteenth century, and in several cases he engraved on them his well-known monogram of the double A, frequently with the addition of a date. The dates found on his work range between 1583

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and 1610, and he, like his predecessors, mostly copied the designs of the great masters of art. Possibly some of them, A. Casolani for instance, were interested in the sale of the prints. Several of the older blocks that were re-used by Andreani show signs of being "wormed," such as that of "Raphael and his Master." In those prints that he engraved himself, he showed decided leanings towards large compositions. An early example of this is his chiaroscuro reproduction of Domenico Beccafumi's mosaic picture of the "Sacrifice of Abraham," on the pavement of Siena Cathedral. This is in ten sections, of which the two largest, composing the central portion, each measure about 36 × 18 inches, the complete picture being some 7 feet long by 3 feet high. The outline is in black as usual, tinted in sepia and light brown. This print was published in November, 1586, and dedicated to the Duke of Urbino. Three years later another very large one was produced, the subject being the "Overthrow of Pharaoh," after Titian. It measures about 4½ × 2½ feet, but is not nearly so good an example as the other. It appears to have been printed from single blocks, the print not being in sections, but if this was the case, probably two pulls of the press were necessary for each impression. The "Entombment of Christ," after G. Scolari, is an upright print about 20 × 30 inches, whilst the "Rape of the Sabines," issued in 1585, is in three sections, covering together about a square yard. From it we learn that Andrea was both printer and engraver (*eam incisit impressit*). Like many other print producers, he found it convenient, and probably remunerative, to dedicate his pictures to various friends or patrons. The inscriptions are xylographic, the lettering being usually in a large script character. A passage in that on the "Triumphs of Julius Cæsar" (1599) informs us that the work was "presented in a new style," *i.e.*, drawn and engraved on wood. This is, perhaps, Andreani's finest piece, and extends to nine numbered sections, each about 15 inches square, without reckoning the two which are occupied by the dedication and ornament. The print of

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" Love Binding Virtue " (Florence, 1585), is dedicated to Francisco de Medici, Duke of Tuscany. An interesting and unusual print is the " Allegory of Death," after G. F. Fortuno. The central portion represents a wheel, provided with a movable hub in the form of a ring, enclosing a skeleton holding a tablet with the syllable " mus." Along the spokes are Latin inscriptions which all terminate in words ending with " mus," so that the hub can be turned to complete any of them, such as *unde superbi(mus)*. A companion print, " The Allegory of Christianity," after Battiste Franco (Mantua, 1610), is dedicated to Louis Gonzaga, and has an inscription not only at the foot but also round the margins of the print. In it Andrea says that having long wished to perpetuate some noble design, he finally decided to make use of this, and had executed it in the new style of engraving and printing from wood. This print also bears the significant remark, " Superiorum premisum" (*sic*), denoting that it had been passed by the ecclesiastical Censor.

Bartsch mentions a few other Italian chiaroscurists, but in a work of this nature it is not necessary to enumerate the names and productions of all those who practised that art. G. N. Vicentino engraved in this style in Bologna about 1530, but his prints do not call for detailed notice, presenting hardly anything out of the common. Parmegiano furnished some designs for him, and in one of them, " Christ Healing Lepers," Vicentino used two shades of purplish mauve, an unusual colour for this class of print. The same colouring appears in Maturin's " Clælia." Several of Vicentino's sets of blocks were re-used by Andreani, who generally added his monogram and a date. Reference may also be made to the work of Bartholomeo Coriolano of Bologna, who engraved many prints in chiaroscuro during the first half of the seventeenth century, one of which is dated from Rome in 1627. He seems to have been fond of ringing the changes on the tones. Of a single small print of the Virgin and Child (1630) there are ten states or varieties in the British Museum, one or two of which are printed on blue

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paper. Most of his prints are after designs by Guido Reni, and some of the ovals, such as the "St. Mary" from the Church of St. Thomas in Bologna, have decorative ornament in the spandrels between the picture and its square frame. Coriolano often used what in these days would be termed a ruled groundwork, for shadows or broad spaces in only a single colour, a style which reminds one of the title-page to Goetz' *Emperors*. For several of his productions he would appear to have found a patron, and in such case the names of himself and Reni, which usually occupy a couple of small panels, are replaced by the name, titles and arms of the person to whom the picture was dedicated. One large allegorical design is dedicated to the Senate of Bologna, and from an inscription at the foot we learn that it was published "ex Typographia Ferroniana, 1653." The fact that it had been approved by the Censor is also mentioned. This engraver's largest chiaroscuro is probably that after Reni's "Victory of Jupiter over the Giants," which is in four sections, measuring over all about 40 × 24 inches. It is in two or three shades of brown. Pope Urban VIII was so pleased with Coriolano's print of Reni's "Madonna" that he made the engraver a Knight of the Order of Loreto, and on those prints produced after 1640 he accordingly puts "Eq." after his name.

We may next mention briefly the work of Fredk. Bloemaert, in Holland, and F. Busingk, in France. The former (1600-?) was located in Utrecht, and engraved several prints in chiaroscuro in the Italian style, using not more than two or three tone blocks. His work in this line is of special interest, because in some cases he used the blocks for colouring engravings on metal, such as etchings, as well as woodcuts. This method of producing coloured pictures became more popular, however, in the following century, in the hands of Le Sueur and others. But Bloemaert was not the first to use it, as Mr. Hinde, in his work on *Engraving and Etching*, mentions an etching dated 1538, representing a pair of lovers, which was coloured by a tone block. This print is now at Hamburg, and was produced

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within about twenty years after the invention of etching. Bloemaert's father, Abraham, was himself an artist of some note in his day. Many of his designs were engraved by his son, and in 1740 a collection of them was published at Amsterdam by R. and J. Ottens in a large folio volume, with the title of *Oorspronkelyk en vermaard Konstryk Te Kenboek.* The plates are in general ordinary line engravings, but in a few cases a duplicate impression is included, coloured in brown from a tone block engraved in the chiaroscuro style. The frontispiece to Part I, in which two tones of brown were used (probably representing the elder Bloemaert at work in his studio, surrounded by models of the human figure), is the best plate of this kind in the book, and there is also a portrait of the artist, tinted in the same manner. One of F. Bloemaert's best prints is the "Holy Family," after L. Busis, and the same picture was afterwards issued by Busingk. This latter engraver was born at Minden in 1590, but ultimately found his way to France, and was working at Paris in 1640. He is considered the introducer into France of the chiaroscuro method of producing pictures. Many of his prints were after Geo. Lalleman. There is a series of half-length figures of Christ and the Apostles, in two brown tones, that being the colour mostly affected by this artist, who thus leant to the German rather than to the Italian style. In a few of his prints, however, there is a greenish-grey tone. His outline cuts are frequently of a bold coarse character. A fairly representative example of his style is the "Virgin and Infant Christ," in two tones; an oval within a plain rectangular frame, with the spandrels filled with a ground colour. This bears the date of 1623. According to Papillon, some of these prints were produced in three colours, on a special type of press invented by Lalleman. The earliest form of this was a triple press, as it had three platens side by side, all operated by one pull of the bar, but as the impressions produced were not sharp enough to please him, Lalleman made another press, approximating more to the style of that used for copperplate printing. It

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had three tables and six rollers, and required four men to work it. Each of the three blocks was inked by a different man, whilst the other turned the cross or handle, and thus gave the three impressions simultaneously. Both presses and prints seem to have been commercial failures.

Prints in chiaroscuro were evidently not intended for use as book illustrations, but for sale as separate plates, or occasionally in sets. This was the rule, but like others it admits of exceptions, and a noteworthy one is furnished by Hubert Goetz' *Lives of the Roman Emperors*. There were several editions of this work, of which that published at Antwerp in 1557 is the best. It is a folio volume, with an engraved title in rococo style, embodying a central panel with portrait. The outline block is in black, tinted in brown, the whole being on a background of narrow horizontal stripes of green, the interstices between which are also brown. The work is illustrated by 155 circular medallion portraits, about five inches in diam., and many more were probably intended, as a number of spaces are left blank. The actual outlines of the portrait appear to have been printed from metal surfaces engraved in relief, and are tinted in two shades of brown, the inscription round each being in white lettering. J. Gietlengen, of Courtrai, engraved them. For the edition of Goetz' works, printed at Antwerp by Moretus in 1645, the portraits were re-engraved on wood by C. Segher, and were printed in black on a plain yellow ground. The original blocks, which cost six florins each to engrave, are still preserved in the Plantin Museum at Antwerp. Another member of the Goetz family, Hendrik (1558-1617), engraved a number of designs in chiaroscuro: Bartsch mentions twenty-one, mostly classical subjects in black and two tones, yellowish-browns and blue-greens being the colours employed. There is a good series of ovals, mythological deities, 14 × 10 inches, and a large print of Hercules killing Cacus, dated 1588, but none of them present any special feature of technical interest; the style leans to the German rather than to the Italian school. In several cases,

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proofs on blue paper of the black outline block have been preserved, which suggest that Goetz tried this method of getting colour effect in his prints. Two or three designs by P. P. Rubens are said to have been engraved in chiaroscuro by C. Segher, including the portrait of a "Man with a Beard."

The ornamental borders on title-pages were occasionally coloured in the chiaroscuro style in the early days of that art, and a Strasburg printer named John Schott has a reputation for producing books with colour decorations of this kind. Seeing that they both worked in the same place and at the same time, it is not unreasonable to assume that Hans Baldung may have engraved, or at least inspired, the colour blocks, though the woodcut designs they supplemented were, in the later books, probably by Hans Weiditz. The earliest work in which a chiaroscuro title-page appeared is perhaps the *Lectura super liber decretalium* of Nic. Panormitanus, which was produced by Schott in November, 1510. Here the decorative border to the title-page (the volume is of folio size) is printed in black and dark brown, in the usual German style. The date on the black block is 1511. The blocks on this particular title-page were afterwards used by R. Beck, another Strasburg printer, in his *Alexandries* (1513), but in this case the colours were the more common red and black. The border design is a woodland scene, with trees and birds, and a group of animals below, with the Imperial arms and the words "Cum privilegio Imperiale." The surface of the colour block is nearly solid, the lights being only very slightly indicated. It encloses the lettering of the title, which is also in red and black. The black block was printed last, and in the British Museum copy of the work the red one shows signs of having been badly inked. A smaller example of similar character is seen in J. Lupus' *De Libertate Ecclesiastica*, printed by Schott in February, $15\frac{11}{13}$. This is a small octavo volume, having the title within a border of Holbeinesque character, representing a wrestling match, printed in red, with the high lights only faintly indicated. The tone block was evidently printed first, and this

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practice was followed in other cases, the colour blocks being impressed on the paper first, and the outline cut registered with them. In the example under notice, the lettering of the title is in red and black, each portion being worked with its own colour block. In 1515, an edition of Ovid's *Metamorphoses* was printed by Schott for P. Goetz, and this has a similar woodcut bordered title-page in red and black. Brunfel's *Precationes Biblicæ*, produced by Schott in 1528, also has a woodcut border to the title, printed over a red ground, although the tone block for the latter seems to have little or no engraving upon it. Every page of this little volume is surrounded by a woodcut border, but printed in black only. The lettering of the title is in red and black, as in Lupus' book. In Brunfel's *Herbarum*, printed by Schott in 1530-2 in two volumes, the title of the first is in red and black lettering, surrounded by a woodcut border printed in black, but on the third leaf is a full-page coat of arms (10 × 6¼ inches) printed in red and black in the chiaroscuro manner. Another example of Schott's colour work is in a different style. This is the map of Lorraine in an edition of Ptolemy's *Geographia*, printed in 1520. The volume is a royal folio, and the map is therefore of large size. It is surrounded with a border of shields printed in red and brown, and pierced out in places for armorial devices, such as lions, fishes, etc. The mountains, rivers and forests are also printed in brown, the last named being indicated by rows of little trees. At the top of the map are two shields, one in brown on a red ground, the other in red on a brown ground, the lettering on the map being in red and black. Red seems to be the colour that was printed first, followed by brown, black coming last.

If, as just suggested, Baldung originated these title-page borders in chiaroscuro, the work must have been afterwards carried on by some other engraver, as Baldung migrated to Freiburg about 1511. Weiditz was in Augsburg until 1522, so that any chiaroscuro title borders printed by Schott between these dates were probably from stock blocks. Weiditz, in his

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turn, may have derived inspiration for engraving for colour work from Ratdolt, who continued to print in Augsburg until his death in 1510, and employed colour decoration in several of his books. For example, the Constance Missal and the Passau Missal, produced by him in 1505, have large ornamental woodcut initials, and the arms of the see, printed in red and black combined, and his large device at the end is likewise in red and black. Ratdolt also brought out a Constance Breviary in 1509, on the reverse of the first leaf of which is a large woodcut of the arms of the see, with much ornamental detail, shield, mitre, bands, etc., being printed in red, black and yellow, though the last may perhaps have been stencilled. The red and black device occurs at the end of this volume also.

The first half of the sixteenth century was one of the best periods in the history of typography, not only for the beauty of the lettering, and the almost faultless technique of the general arrangement, but also for the wealth of pictorial embellishment and ornamental detail which the great printers of that day lavished upon their productions. It was essentially the era of the woodcut-bordered title-page, although examples are not uncommon in fifteenth century books. This border lent itself particularly well to the application of colouring, and hence the majority of examples of colour printing at this period are found in connection with book titles. The two-colour title-page, *i.e.*, that in which the lettering was printed in red and black, was so common that it is not necessary to do more than refer to it here, and as red was at all periods the most common variant from black in book work, examples of it will not be dealt with in detail, except in a few special cases, as not merely the lettering in titles, but printers' devices, colophons, rubrics, headings, and initials in red were in use by almost every printer of note at this time. Typography in red and black always makes a brave show, especially when the type is of Gothic character and plentifully besprinkled with the historiated (or pictorial) and the criblé initials—with the letter showing against a background of white stipple—which form so

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prominent a feature in the books of this period. An opening passage in capitals, with an ornamental headpiece or initial, was often printed in red, with fine effect, in some of the old Greek folios, such as Callierges' *Etymologicum Magnum* (Venice, 1499, one of four volumes similarly decorated), or, on a less ambitious scale, in the *S. Oecumenius Commentaria* (Verona, 1532). Commentaries on Civil or Canon Law, such as the Codices of Justinian, or the Decretals of Pope Gregory IX, with their frequent rubrics, provided splendid opportunities for the use of colour, which the printers were not slow to take advantage of.

Some of these volumes are almost pictorial in their display of typographic colour effect. Take, for instance, the work on Justinian's codes, known as the *Volumen*, in the edition printed by A. Bocardo at Paris, for T. Kerver and others, in 1511. This is a quarto of about 7½ × 6 inches type measurement, and nearly every one of its 650 and odd pages is printed in red and black Gothic type, usually in four columns, with a beautiful series of criblé initials. The opening at folio 197—to quote only one example—contains a dozen of these, in four different sizes, printed in black; nineteen smaller outline initials in red, in two sizes; two dozen paragraph marks, and eighteen textual passages of greater or less length, all in red, and in three sizes of type. A couple of pages like this would give a compositor a lot of trouble to make up even now, yet the book goes on in that style through hundreds of pages, the two colours being generally well registered, and the ink retaining some of its gloss to this day. Similar work, on a larger scale, and in Roman letter, is seen in an edition of the *Institutes* published by Ausultus at Lyons, about 1557. The type measurement of a page is 15 × 12 inches, and the initials are historiated, the rubrics being largely in italics. The general appearance of the work is more massive and dignified than the other, but although the passages printed in red are not quite so frequent, yet another arrangement that was adopted made the compositor's work more difficult than ever. The references

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to the marginal notes in the outer columns are single lower-case letters, printed in red, at the end of the word or passage commented on. In many cases there are dozens of these letters on a page, every one of which had to be accurately registered into the tiny white square reserved for it. In looking at such books as these, one cannot but feel respect for the patience and skill of the old-time printer.

Before leaving this branch of the subject, one other example may be mentioned, the Almanac, which for centuries was printed in red and black in nearly every European country. A single instance will suffice to illustrate the complexity of the work its preparation often called for. In Stoeffler's *Calendarium Romanum*, printed by Koebel at Oppenheim in 1518, many pages are divided by rule work into hundreds of little square spaces, each containing a numeral in black and an astronomical sign in red. The volume has also four full-page cuts of astronomical instruments, printed in red and black.

Book illustrations, printed in any other colour than black, are not common, though printers' devices are frequent enough. An early example of genuine pictorial work occurs in a book on the Spanish Order of Santiago, printed at Seville in 1503, by J. Pegnitzer, of Nuremberg. On the reverse of the seventh leaf is a full-page cut of the Saint on horseback (8¼ × 5¼ inches) printed in red and black, in a manner somewhat suggestive of the chiaroscuro style, though it was probably quite an independent effort on the part of the engraver and printer. There are also two large devices of the Order in red. The " piercing out " of blocks for colour work was in common use more than four centuries ago, and a case in point occurs in H. de Montagnone's *Epytoma Sapientie*, printed by P. Liechtenstein at Venice in 1505. The reverse of the last leaf has a full-page device of the printer, a shield, with a solid ground, of which one-half is red, the other black, pierced in two places, in exact shape and size, for the insertion of two small identical blocks of vases, surmounted by orreries. On the red half of the shield the vase, etc., is printed in black,

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and on the black half in red, a similar, but larger block above the shield being in black, over-printed with a diagonal red band. The same two-colour device appears in this printer's books as late as 1538. Another printer's trade-mark in two colours occurs in the first volume of an edition of the Bible in French, printed by Bartholomew Verard at Paris about 1514. The letterpress matter above it, in large Gothic (xylographic ?) type, is also in red and black.

Sometimes, as in the *Repos de Conscience* (Trepperel, Paris, *c.* 1505), a single woodcut out of a large number is printed in red for no apparent reason. In Sabellicus' *Chronicle* (Lampugnano, Venice, *c.* 1508), the lettering on both the first, or title, and the last, or colophon pages, is printed wholly in red, and enclosed in an ornamental woodcut border in black. In this instance the colophon is itself engraved, in large xylographic Gothic characters. In the edition of Cæsar's works, printed by A. de Zannis de Portesio at Venice in 1517, this arrangement is reversed; the upper half of the title-page is occupied by a large woodcut, printed in black, within an ornamental four-piece border in red, there being also a line in large red Gothic letter just below, followed by several lines in black, diminishing in length in the manner common in that day, below all being a small red cross. The same woodcut and border are repeated on folio 1 of the text, but in black only. Senfel's *Liber Selectarum Cantiorum*, printed at Augsburg in 1520 by Grimm and Wursung, exhibits a reversal of this arrangement, the colour work being on an inside page. This is, perhaps, the most elaborate piece of book work in colours that has come down to us from the period under review. The volume is dedicated to Matthias Lang, Archbishop of Salzburg, and the front of the dedication leaf is occupied by his arms, on a shield surmounted by a cross, above being a Cardinal's hat, the pendant cords and tassels of which fill up the sides of the page. The hat is supported by two cherubs or naked boys, a decorative *motif* which is usually associated with the work of Hans Weiditz. Seven colours are used, viz.: red, grey, blue,

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flesh-pink, gold, black and a greenish-yellow. The cross is in gold, and an attempt was made to represent the jewels in it in their natural colours, but they are so small that the tinting is hardly perceptible. The hat and tassels are, of course, in red, and there is a sort of shading following the latter, printed in grey. The cherubs and their scanty garments are in five colours, the sashes pendant from them being differently tinted in each case. The quarterings on the shield, lions rampant, are in red on a gold ground. Grey seems to have been the first colour printed and black the last. It would be interesting to know whether Weiditz was responsible for his design (it is considered to be his) being reproduced in colour in this remarkable way. The tints are solid and the impression is heavy in some parts of the picture. The back of the leaf, which is of the ordinary book paper of the period, is occupied by the dedication, a page of black-letter type.

A *Breviarum Romanum* in 12mo., issued *sine nota*, but referred to *c.* 1520, contains half a dozen full-page cuts, within borders which are apparently made up from type ornaments, an early example of this class of work. Some of these borders are printed in both red and black, and the text of the volume is, of course, in these colours throughout. Another similar example occurs in the Breviary printed at Venice by J. Pentius in 1526. Here the borders are made up of small " flowers," and several of them are in both red and black. An unusual combination of colours occurs on the title-page of Amb. Leo's *Opus Quæstionum*, printed at Venice in 1523 by B. and M. de Vitali. The lettering is in red, within an ornamental woodcut border printed in blue, an almost solitary instance of the use of that colour for such a purpose.

Another interesting piece of French colour work occurs in J. de Guyse's *Chroniques de Haynau* (Paris, G. du Pré, *c.* 1532). The title-page to Volume I is surrounded with a woodcut border in four pieces, the design being of the usual Francis I type. The top and bottom sections have a circular portrait at each end, so that there are portraits at the four corners of

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the page. Each of them is coloured in red, beneath the black, from another block, which was possibly intended to impart a chiaroscuro effect to the portraits, but if so, the engraver evidently did not understand the principles of that branch of his art, as the red block is merely a collection of broken lines, and thus obscures and confuses the black outlines of the original woodcut. The title lettering within the border is also in red. On the title-page of Volume II the arrangement is repeated, but on that of Volume III, though the same border is used, it and the enclosed lettering are wholly in black. The title to J. Caviceo's *Le Peregrin* (Lyons, C. Carcand, 1533) is in red and black lettering within an ornamental border, which encloses the printer's device in black, in its turn enclosing a red heart on a shield, ensigned by a crown. A volume of Italian poetry, *Il Primo Libro de Reali*, by Altissimo (Venice, G. A. de N. de Sabio, 1534), has the fine woodcut border to the title, a design consisting of grotesque animals and human figures, printed entirely in red.

A curious bit of red and black work is found in the *Due Trattati* of G. Camillo, printed at Venice in 1543. On the obverse of folio 13 the text, in black, is arranged in the form of a circle, beneath which (*i.e.*, under the black lettering) is a wheel printed in red, with a sentence, also in red, at the end of each of the spokes.

This little list of examples of bookwork in colour began with a Spanish publication, and it now ends with another, viz.: P. Medina's *Arte de Navegar* (Valladolid, F. de Cordova, 1545). The section devoted to "Altura del Sol" has a fine frontispiece, including a large figure of the Sun in red, with red and black lettering beneath. Systematic research, which would, however, call for the expenditure of a great deal of time, would no doubt bring to light many other, and possibly more elaborate specimens of the colour work of this period. The catalogue of the Caxton Exhibition, held in London in 1877, mentions two book-titles printed in colours, which the writer has not been able to trace, one, dated 1522, from a Wittenberg press, and

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another by H. Schahsser, Munich, 1524. Colour effect in books was sometimes, though very rarely indeed, attained by printing the text on coloured paper, as in a copy—possibly unique—of Celestina's *Tragicomedia*, issued at Venice in 1553, and in an undated Barker-printed edition of the Book of Common Prayer, attributed to 1578, a copy of which is at Cambridge, printed on green paper.

Although books printed in France, Germany, Italy, Spain, and the Netherlands have been quoted in connection with various kinds of colour work, England has not been mentioned at all, for the sufficient reason that there is practically nothing to talk about; in fact, from the time when the *Boke of St. Albans* was published, down to the issue of Le Blon's *Coloritto*, a period of nearly 240 years, the voice of the colour printer was scarcely heard in the land. During the early part of the sixteenth century, it is true, the English typographers showed themselves quite capable of making-up and printing a book in red and black, though many of the finest volumes of this kind were produced abroad for the English market, like the beautiful Sarum Missal printed in Paris by W. Hopyl, in 1504, for a London bookseller named Birckman. English two-colour bookwork survived to the end of Henry VIII's reign, as seen in that monarch's *Primer*, issued in 1545 by Grafton, which has the rubrics in red throughout. But in the first Book of Common Prayer of Edward VI (1549), the red and black lettering was confined to the title and contents pages and the Calendar, so that the two-colour Church Service book may be said to have then disappeared from England (except for the few years of Mary's reign) until the Victorian Era.

Banished from the liturgy, perhaps because its use might have aroused Romanist associations which were best left to slumber, printing in red and black found a permanent resting-place in the Almanac, where it flourished in England undisturbed until the middle of the seventeenth century, when the title-page in red and black came into fashion again for ordinary books, especially folios. An earlier and rather elaborate

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letterpress title in red and black is that to Reeves' *Christian Divinitie*, 1631. Books of a higher order than almanacs, printed in red and black, were not common in England at this time; Broughton's *Commentary on Daniel* (London, 1597) has three and a half pages of Hebrew text printed in that style, but a more unusual example is *Polycarpi et Ignatio Epistolæ*, printed at the Oxford University Press in 1644. In the first part, passages from the Greek and Latin versions are printed in parallel columns, in order to show some interpolations, and in both frequent sentences in red occur. In the second part the Epistles are printed in full in both languages, and in the Greek text the rubricated passages are very numerous, and sometimes of considerable length, extending here and there to an entire column; even the list of errata is in red and black. This is a fine and picturesque piece of rubricated typography, and was preceded in 1633 by a similar work, Pope Clement's commentary on the Epistle of St. Paul to the Corinthians, in which, however, the two-colour work is on a much more modest scale.

Pictorial printing in colours seems to have been quite unknown in England until Le Blon's time, as the elementary armorial devices in the *Boke of St. Albans* can scarcely be ranked as pictures. The only attempt at anything of the sort, and a very faint attempt it was, is of the kind which may be seen exemplified in the astrological diagram of the human body which occurs on the back of the title of the *Necessari Almanacke* for 1560, printed at London by Thos. Marsh; and, on a more limited scale, in the vignette on the title-page of W. Musculus' *Commonplaces of the Christian Religion*, printed in London by R. Wolfe in 1563. These woodcuts have some of the details printed twice over, first in red and then in black, the second impression being a little out of register with the first, so that the effect is slightly reminiscent of the earlier chiaroscuro style. In a London Almanac for 1584, printed by Watkins & Roberts, the diagram representing the eclipses of the moon for that year is printed in red and black.

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It is curious to find that whereas the two-colour bordered title-page had practically died out on the Continent at the commencement of the seventeenth century, printers in England should be just then beginning to introduce it. *Pond's Almanac* for 1611 has a very crude woodcut border in compartments, evidently of English origin, but printed in black. In *Hopton's Almanac* for 1613 it is used again, but some of the details are repeated in red, in the style of the sixteenth century examples just mentioned. In Bretnor's *Newe Almanacke* for 1615 the same two-colour border occurs, the lettering of the title-page being also in red and black. In the previous edition of Bretnor (1614) a different four-piece border was used, probably of Continental origin, with a globe in the centre of each side, printed in red and black in the same style, as are also the initials "E.A." on the bottom piece of the border. These were probably stock blocks, to which a newly-engraved one for red was adjusted, after the fashion of the Paris book of 1532 already alluded to; but in Bretnor for 1624 a new border appears, probably specially designed for two-colour work. Each of the sides is divided into six panels, containing the signs of the Zodiac, the top having the royal arms, and the bottom the arms of the Stationers' Company, for whom these almanacs were printed. The frame-like border of the panels is printed in red throughout, and the effect is not unpleasing. This is a 12mo volume, but in *Allestree's Almanac* for 1634 the same design appears in a larger size, to suit the octavo page of that publication, and, like the other, is printed in two colours. *Woodhouse's Almanac* for 1628 has a different border to the others, but still printed in two colours. For 1635, the title borders of all the almanacs appear to have been produced in this style; Pechins' and Pierce's had the globe design already referred to; Sofford's and Jefferey's had it also, but with the royal arms at the top, and the Stationers Co.'s below. Only a part of each was outlined in red in these, but in Langley's the whole of the royal arms was in the two colours. In Clark's and Dove's almanacs the border was made up of type ornaments, some

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of which were in red, the rest in black. All these little differences, occurring at the same time, suggest that much experimenting was going on. In *Fallow's Almanac* for 1637 the globe design reappears, as well as in Dade's for 1643, in which case, perhaps inadvertently, the red impression was printed on top of the black. In books other than Almanacs, this class of colour printing seems to have been very seldom used. Fisher's *Defence of the Liturgy of the Church of England* (London, 1630), has the title within a woodcut border, of which the corners are printed in red and black. *The Communion Book Catechism Expounded* (London, 1636) has the letterpress title in red and black, surrounded by a "combination" border printed in both colours. Howell's *Survey of the Signorie of Venice* (London, 1651) has a cut of the Lion of St. Mark on the title-page, printed in red and black. An early novel, *Bentivolio and Urania* (London, 1660), has also a two-colour vignette on the title. Foreign seventeenth century examples of this character are, if anything, rarer still. An edition of the theological works of D. H. Zanchus, printed at Geneva by S. Crispin in 1619, has that typographer's woodcut device of the Sower on the title-page, printed in black, with portions cut away from the top, bottom, and sides, which are filled in with emblematical cuts of cherubs, etc., printed in red. The *Acta Synodi Nationalis* (Dordrecht, 1620) has a shield in red and black on the title-page. In an almanac for 1682, printed at Basle by J. E. de Mechel, some of the woodcuts are tinted by broad masses of red, suggesting the use of the stencil. Examples of the use of a block for furnishing part of the lettering of a title occur in the *Postilla Domestica, hoc est Simplex* (Eichhorn, Frankfort, 1652), the word Simplex being in large xylographic Roman capitals, surrounded on three sides by an ornamental border, this block being printed in red. The title-page of the *Shrift und Planete Kalender* for 1723 (Hamburg) has those words engraved in three lines of German Gothic letter, with accompanying flourished ornaments, all printed in red.

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CHIDLEY THE CENSOR

A curious specimen of English bookwork, entirely in red, is furnished by Samuel Chidley's *Cry Against a Crying Sinne* (London, 1652), a twenty-four page pamphlet of the usual small quarto format of that period. Chidley was a person of humanitarian inclinations, who, " from his mother's home in Soper Lane," penned long epistles protesting against the barbarous nature of the laws that then provided the death penalty for comparatively trivial offences, including that of stealing goods to the value of thirteen pence, and the cruel punishment of " pressing to death " in cases where a prisoner refused to plead. The Court of Common Council, the Army Council, and the Judges at Newgate were successively petitioned by Chidley without result, and finally he appealed to the Lord Protector and the Parliament in a four-page leaflet, also printed in red. Addressing them as " Mortal Gods," Chidley, in the following passage, explains why he had his communication printed in red: " And because you are the Patrons of *England's* Statutes, and have power to redress the Grievances which by your law cannot be redressed without you, I have presented you with these lines printed in red letters because, though *Tophet is prepared of old for Kings*, because of their crying crimes, yet Parliament's sins are sins red as scarlet, of a deep and double dye." Seeing that Chidley, in this address to the Legislature, referred in strong terms to the sins of the " Lying Lawyers," whom he further apostrophised as " Lascivious Lubbers," it is not surprising that he had to protest again, in the *Cry* just alluded to. At the foot of the last page is the following: " By Mr. Chidley's appointment, who is the author of this book, one of them should have been nailed upon Tiburne Gallowes before the execution, with this motto written on the top:—

> 'Cursed be that bloody hand
> Which takes this downe without command,'

as a witness against such cursed proceedings of murdering men merely for stealing food or rayment, but the party could not naile it upon Tiburne-Gallows-Tree, for the crowde of people,

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and therefore was forced to naile it to the tree which is upon the bank by the Gallowes, and there it remained, and was read by many both before and after execution and it's thought it will stand there still, till it drop away." James Heath's *New Book of Martyrs* (Lond., *c.* 1665) has, by way of frontispiece, a list of the "martyrs," commencing with Charles I, printed from type in red.

The seventeenth century appears to be the least fruitful of all periods in the annals of pictorial colour printing. The enthusiasm of the fifteenth and early sixteenth centuries had quite died out, and in its place we have illustration of a very commonplace order. It is true that this was the age of the Elzevirs, but those excellent Dutch printers were not concerned with colour work, and but little with illustrated books. Nor did they do much in the way of printing in red and black, apart from a pretty little volume of Justinian's codes, with commentary. A different class of work is seen in Andrea Ghisi's *Laberinto* (Venice, E. Deuchino, 1616), in which forty-two of the folio pages are occupied by 1,260 small woodcuts of playing-cards, with xylographic inscriptions, all printed in red.

The use of colour printing for the production of the plates for a scientific work is of the utmost rarity prior to the middle of the eighteenth century, but what must be an almost solitary instance of the kind occurs in G. Aselli's *De lactibus sive lacteis venis*, published at Milan by J. B. Bidelli in 1627. This is a medical treatise in quarto, on the chyle ducts of the human body, and has four large folding plates, printed in colours from wood blocks, illustrating various internal organs. They are in a flesh-coloured ground tint, on which the veins, etc., are shown in a darker red, or, by parts being engraved out, in white, some, as well as the descriptive lettering, and the solid ground which extends from the outlines of the picture to nearly the edges of the leaf, being in black, the block applying this colour being worked last. The paper is badly stained with the oil used in the inks.

The production of line engravings from intaglio plates, in

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any colour other than black—now one of the least practised of all colour-printing processes—appears to have taken its rise about this period. A Dutchman, Hercules Seghers (1625-1679), a friend of Rembrandt, was one of the first to practise it. His etchings have often been referred to as early examples of colour printing, but as far as can be judged from an inspection of them there is only a single printed colour, though this is generally some other than black. One of those preserved in the Print Room at the British Museum, a mountainous landscape with a rushing stream in the foreground, is printed in blue, and has in places small patches of a sort of grain, somewhat distantly resembling that of aquatint, though much more irregular and scratchy, suggesting Lutma's "Opus Mallei." This is also found on some other of Seghers' etchings, nearly all of which are more or less covered with pale and washy tints, most likely put in by hand, though some of the darker patches may have been stencilled. Seghers' work, in fact, bears much the same relation to colour printing as does Blake's, most of the tints being obviously hand-work.

Another Dutchman, Peter Lastman, of Amsterdam (born at Haarlem in 1581, and thus contemporary with Seghers), appears to have gone in for the same class of work from 1626 onwards, though the writer has not been able to come across any specimens. When Gautier Dagoty, the French exploiter of the Le Blon process, was in London about 1750, Mr. Mortimer, the Secretary of the Royal Society, showed him some colour prints of Lastman's, studies of birds, fruit, etc., which had apparently been printed from a single plate at one impression. Nothing is known as to the present whereabouts of these pictures. Line engravings in colour are also said to have been produced by Peter Schenck, another Amsterdamer, about 1700.

Abraham Bosse, a copperplate engraver of some note in his day, briefly described, in his *Traité des Maniéres de Graver en Taille douce* (Paris, 1645), a method of printing in colours from copperplates. His idea was apparently to produce those little

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devotional prints of the saints, etc., commonly termed " Images," and which were wont to be coloured by hand. He first took an impression in the ordinary way, from the copper-plate on which the design was engraved, on a piece of damped paper or card, then took another plain plate covered with white varnish, and laid the printed paper down on it, so as to produce in the press a " set-off " reversed impression on the top of the varnish. This done, the varnish under those parts of the design it was intended to colour was cut away, and the plate etched in the ordinary way, the same process being adopted for each colour required other than black.

Whether Bosse produced any coloured pictures by this method is doubtful, as none of his prints of saints, etc., catalogued by Duplessis are stated to be in colours. The most able expositor of the possibilities of colour printing from plates engraved in line was undoubtedly Johannes Teyler, of Nymegen, Holland, who was a military engineer by profession, and an artist and engraver by taste and instinct. Very little is known about him, but as far as colour printing was concerned he was evidently a man far in advance of the times. Who inspired him we do not know, but we do know that he produced line engravings in colour to an extent, and in a variety, that has probably never been surpassed since his time. His work in this direction is only known through the medium of a single volume, a large folio bound in calf gilt, and supposed to date from about 1670. After Teyler's death it remained in the possession of his family down to comparatively recent times, but found its way into an Amsterdam bookseller's sale catalogue in 1868. It is now preserved in the Print Room at the British Museum, and contains 185 prints of various sizes, from a double page down to tiny pictures of caterpillars and other insects. The great majority of the prints are in line, though there are two or three mezzotints, and some of the pictures are partly engraved in a sort of stipple. All are printed in colours, and though many of the larger ones are in five or six tints, they were produced at a single impression. The

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plates were not necessarily all engraved by Teyler himself, the subjects being so diverse as to suggest that he was in the habit of pulling, for his own amusement, proofs in multicolour from every engraved copperplate that came into his possession. The prints include several fine portraits ; a number of classical and mythological subjects, in the usual style of the period ; many views of Rome and Amsterdam ; prints of birds, insects, and reptiles ; architectural elevations, etc. Several of them are too large for the volume, and are thus folded down one edge, as in the case of the title-leaf, though in a few instances they have been barbarously cut down through the engraved surface. The title-page contains a central oval panel surrounded with a frame-like border, the rest of the space being filled with stalk-and-leaf ornament of rococo character. Within the oval space is the following MS. title : " Joh. Tejlerjs | Batavij | Chalcographi ingeniosissimi | Opus | Typo-chromaticum | id est ; | Typi oenei omni colorum genere | simul impressi et ab ipso | primum inventi," *i.e.*, " Typo Chromaticum, by J. Teyler, an ingenious Dutch engraver, being pictures printed from copper plates in several colours at one impression, by a method of which he was the first inventor." His claim to be the inventor is probably a true one, as nothing of the kind is known to have been produced before his time, and, it may be added, next to nothing since. This title is a fine piece of work, printed in black, yellow, olive-green and red. Next come the portraits, nine in number, of unknown personages, mostly females of royal or noble birth. One is after Sir Godfrey Kneller and two after Van Dyck. Among them is a bust portrait of a lady, engraved in mezzotint, with a wreath of flowers beneath ; this has been cut down to the outlines of the figure, and mounted, so that we cannot tell what the complete original was like. The majority of the prints in the volume are pasted on its blank leaves, though some of the finest have been printed on the leaves themselves. A good many more have been removed from the book at some time or other.

The most remarkable feature about Teyler's colour work is

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the way in which the different tints range flush with each other. In processes where a separate block or plate is used for each colour, this is of course expected, but when a single plate is inked in six or more colours, all bordering on each other, it is almost impossible to rigidly preserve the line of demarcation between them, yet Teyler seemingly accomplished this with ease, and with such skill that only a careful examination of the prints can convince that all the colours were printed at a single impression. The sombre tints of the chiaroscurists were not used by Teyler, who, instead, revelled in brilliant reds, blues, greens and yellows, natural colouring being adopted as far as possible. The work is, perhaps, seen at its best in the lightly engraved classical subjects, as in the heavily shaded background of some of the portraits the colour has been transferred in almost a solid mass, thus partly obscuring the lines. Two or three designs for fans are especially good, but in some cases the colouring is more curious than beautiful. This is generally so with the architectural elevations, where blue roofs and steps, red doors and vanes, and yellow fronts make up some rather crude colour contrasts. No matter how minute were the details on some of the plates, Teyler managed to ink them in colour, probably with the aid of a brush. In some views of the interior and exterior of St. Peter's, at Rome, there is a number of figures only half an inch high, but they are all printed in different colours. Many of the pictures in the volume have been worked on in water colours by some later and rather unskilful hand, but where Teyler's colour printing is intact it is as brilliant as when first executed. One of the portraits is evidently in the "first state," as blank spaces appear for the name and arms of the person represented. Another, a fine full-length portrait of a lady, with a coronet on a cushion at her side, is beautifully printed in half a dozen colours, though one or two of these are rather less bright than Teyler's are wont to be. Whatever he may have been as an artist and engraver, there is little or no sign of the amateur in his colour-printing work; nor is there any suggestion in the

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Reduced facsimile of line engraving. Printed in colours by J. Teyler, of Nymegen, about 1760. Kindly printed by Messrs. Taylor Brothers, Leeds.

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volume that he intended to publish a book of such prints, it being quite evident that they are special proofs, from plates inked and printed by Teyler himself as a sort of hobby. Why a man who had, as it were, thus invented a new form of art, which has remained almost unpractised since his day, should have been content to hide his light under the bushel of a little Dutch town, will probably never be known. His unique book has, however, rescued his memory from oblivion, and were some of the art print publishers of the present day to see it, it would probably reveal to them hitherto undreamt of possibilities in the way of colour prints. The process, it is true, is both slow and expensive, but seeing that the five-guinea colour etchings so popular just now, and mostly produced by a somewhat similar method, find purchasers easily enough, there should be an equally good field for the exploitation of multicolour line engravings.

One of the most prolific Italian etchers and engravers of this period, G. M. Mitelli, of Bologna (1634-1718), printed a few of his line engravings in red. One of these represents St. Philip Neri, after A. Algardi, and another a Roman galley, with soldiers. A rather novel style of colour printing is seen in the plates for the anonymous *Peristromata Turcica, i.e.*, Turkish Carpets, published at Paris in 1641. This is " an emblematical dissertation on the state of Europe " in its relation to Turkey and Turkish intrigues, and contains half a dozen copperplate line engravings—one of which serves as the title-page—representing carpets, which are printed in one colour, a rectangular cut-out space in the centre being filled with an emblematic engraving in another, so that where the carpet is black, as it is in four cases, the centre is red, and *vice versa*. A similar method was used on an eighteenth century Italian title-page in the writer's possession, of *Della Prudenza*, dedicated to P. V. Pisani, Procurator of St. Mark's, Venice. Most of the space is occupied by a fine rococo design printed in blue, within the central panel of which is the lettering, printed in red from a second plate.

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Before quitting this period, brief reference may be made to another method of producing colour effects on paper, the invention of which is generally ascribed to the seventeenth century, *i.e.*, " marbling." Whether first practised in France or Holland cannot be exactly determined, though the latter country is usually credited with the honour. The earliest English patent connected with it is that of Redrich & Jones (1724) but if a passage in one of Bagford's MSS. is to be believed, the introduction of the process into this country dates from some thirty years before. He attributes it to one Dr. Garenciéres, who was perhaps a Huguenot refugee, and had learned something of the process in France. Finding that the foreign marbled paper was dear, he started to make it in London, at Clerkenwell Green ; but his productions were duller and not so glossy as the Dutch, so he turned his attention to the manufacture of the necessary colours, in which he was so successful that on his death he left a prosperous business to his daughter. One of the Bagford scrap books preserved at the British Museum contains a number of specimens of the marbled paper of two centuries ago, but they are mostly of quite ordinary character. It will be remembered by readers of *Tristram Shandy* that a piece of marbled paper serves as an illustration in that work.

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CHAPTER III

COLOUR PRINTING IN THE EIGHTEENTH CENTURY

SECTION I

LE BLON'S THREE-COLOUR PROCESS. THE LATER WORKERS IN CHIAROSCURO.

ITH the coming of the eighteenth century, the art of colour printing at last threw off the shackles which had for so long confined it within comparatively narrow limits, and emerged into the full light of day. Most of the processes operated during this period are still continued, though on modified lines, at the present time. Genuine colour prints, as distinguished from the rather cold and gloomy ones in chiaroscuro, now began to be introduced, and although chiaroscuro work was again revived, it took on to some extent a more brilliant dress. The introduction of new methods of engraving was largely responsible for this improved state of things. Hitherto, with the almost solitary exception of Teyler's work, which, perhaps, never came before the public eye in any quantity, the woodcut had formed the sole medium of production, engravings in intaglio being only used in a few isolated cases.

Before proceeding to deal with pictorial work, something may be said concerning letterpress printing in colours, of which a particular interesting example belongs to the early part of the period under notice. Appropriately enough, it is the work of a printer at Mentz, the cradle of typography, and occurs in an edition of the works of Raymond Lully, the thirteenth century alchemist, which was issued in eight ponderous folio volumes between 1721 and 1742. There is colour work in most of them, but only two are specially

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remarkable in this respect. Each contains about a score of separate plates of tables and diagrams, mostly printed in four colours, blue, green, red and yellow. The diagrams are very interesting. In a circular space are four square or triangular tablets, with a common centre, but arranged at different angles; each is printed in a different colour, not solid, but from engraved lines. This inner circle is surrounded with other concentric ones, divided up by rule work into a number of spaces containing lettering, also printed in several colours. The table work is still more remarkable; that headed "Figura Objectum" occupies a full page, divided by rules into a large number of rectangular spaces, containing capital letters printed in red, blue, yellow and purple. Some characters, such as "V," are themselves in two colours, each limb being in a different tint. The "Figura Secunda" following is so large as to require two sheets for its presentation, which, in each case, takes the form of a large triangle divided as before into spaces about ¾ inch square, in each of which are words printed in two colours. In this manner, on various pages, are the warring elements textually depicted, the virtues and vices contrasted, etc., in the manner set out in Lully's writings. The printer of the earlier volumes, who was certainly to be congratulated on his skill and patience, was J. G. Häffner, who probably died during the twenty years the work was in progress, so that the task was finished by his son (?) J. H. Häffner, who, however, printed his tables in the common red and black only. As an example of semi-pictorial letterpress work in colours, this production probably stands unrivalled, even the rule work and the descriptive lettering being in colours; the inks used have generally retained their brilliance unimpaired and good register is maintained throughout. There is a complete set of the volumes in the British Museum, but an odd one, which, however, contains the best exposition of Häffner's colour work, can be inspected at the Technical Library of the St. Bride Foundation.

From the colour printer's point of view, the most important

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achievement of the early part of the eighteenth century was the invention, by James Christopher Le Blon, of his three-colour process. Probably few, out of all the hundreds of persons who operate an almost identical method in this twentieth century, are aware that the principle was not only understood, but practised nearly two hundred years ago, for the purpose of producing coloured pictures, the only important differences being that Le Blon had not the use of a camera, and that his plates were engraved by hand. As so many important inventions connected with printing—not to speak of that art itself—have had their birthplace in Germany, it was quite fitting that Le Blon, though of French extraction, had his there also, viz., at Frankfort-on-the-Main, in May, 1667. For many years after attaining early manhood, he led that wandering life which is the lot of most German art students. His training was acquired mainly at Zurich, but subsequently he went to Rome. Seeing that he was shaping rather badly there, a Dutch friend took Le Blon back with him on his return to Holland, and he then settled down for some time as a portrait and miniature-painter at Amsterdam, in the commencement of the eighteenth century.

Thirty years before this time, the great English philosopher, Isaac Newton, was engaged in his celebrated investigations into the laws of nature. Among other theories he propounded, in connection with his researches into the nature of light and colour, was one to the effect that the variegated hues of the spectrum of white light are merely combinations of certain primary colours, which are simple and uncompounded, *i.e.*, are not the product of any other combinations. Newton, therefore, held that all other tints and shades in nature are the result of combinations of these in varying proportions. He was of opinion that there were about seven of these primary colours, whilst another scientist of that day, Hooke, held that there were but two, scarlet and blue. The Newtonian colour theory was subsequently modified to the present one, that there are three colour sensations, which can be represented by red,

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blue and yellow. In this form the idea seems to have attracted the attention of Le Blon, who was perhaps the first to apply the principles supposed to govern colour in nature to the representation of colour by the processes of art. His treatise on the Harmony of Colouring was probably not written until a later period, but its teaching was no doubt practised by him from the first.

The medium he selected, for the purpose of demonstrating the correctness of the theory, was the engraving method known as Mezzotinting, which had been invented about half a century before, probably at Amsterdam, by Lieutenant-Colonel Louis van Siegen, an officer in the service of William VI, Landgrave of Hesse. Mezzotint engraving is effected by puncturing or breaking up the entire surface of the copper-plate by means of a rocker, an instrument like a broad chisel, with its edge ground to the segment of a circle, like the rocker of a cradle, one side being engraved in parallel lines, so as to form minute teeth on the curved edge. This produces a uniform burr, which is afterwards reduced to various degrees of intensity by scraping and burnishing, thereby regulating the amount of ink capable of being retained by the plate, the richest black being printed from the plate in its original state after the rocking, and before being worked on. The process was extensively used in the production of portraits, and afforded fuller and richer effects of gradation from light to shadow than either etching or ordinary copperplate engraving. Mezzotint, in fact, having a sort of "grain" as a basis, renders the middle or half-tones of a picture better than any line engraving process can do; thus Le Blon, in selecting it as the most suitable one for use in connection with his invention, started to work not merely a "three-colour," but a three-colour half-tone process.

In the three-colour process of to-day the colours are selected and arranged automatically by the camera, through the medium of the light filters, but Le Blon, having no camera to assist him in colour selection, had to proceed in the same way as

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the expert chromo-lithographer does, *i.e.*, to mentally analyse the colour scheme of any picture he proposed to copy—he used the process mostly for this purpose—and to prepare his colour plates accordingly, just as the lithographer prepares his stones. There was one mezzotinted plate for each colour, and it is to be gathered from some of his pictures that he printed the blue first, then the yellow, and lastly the red. Having prepared some specimen prints about 1704, Le Blon showed them to many eminent persons, including Prince Eugene of Savoy, and having obtained their commendation, tried to form a sort of syndicate to exploit the process. Failing to do this in Holland, he, about 1705, went to Paris, but as mezzotinting never took root in France, he was equally unsuccessful there.

He then decided to follow the advice that had been given him by Lord Halifax, to go over to England, and arrived in London about 1719. Here he found a public to some extent sympathetic. The art of engraving in mezzotint had been described in detail, with illustrations, in the *Sculptura* of John Evelyn, of *Diary* fame, as early as 1662, and so was fully understood in England, and appreciated also. Le Blon found a firm supporter in Colonel Sir John Guise, an art amateur, who promised to put money in the proposed syndicate himself, and no doubt induced many of his friends to do the same. George I was graciously pleased to take an interest in his countryman's enterprise, and accorded him permission to copy some of the pictures at Kensington Palace, so that all things looked promising for a start. A prospectus was issued, a Company formed in 1720 with the title of "The Picture Office," the necessary capital raised, and Le Blon appointed technical director, Colonel Guise being the chairman of the concern, which had its headquarters at the "Dutch House" in the Savoy, where a large staff was employed. All went swimmingly for a time; 25 pictures were copied, and several thousands of three-colour prints produced, to sell at prices from 10s. to 21s. each, according to size.

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We get some interesting details about "The Picture Office" from family papers preserved among the Earl of Egmont's MSS. On August 30th, 1721, James, Lord Percival (afterwards first Earl of Egmont), wrote to his brother from London on the subject, advising him that he was sending seven specimens of Le Blon's work, which cost £3 14s., including 10s. for the "Magdalene," after Caracci, and 12s. for the "Susanna and the Elders." Said his Lordship: "Our modern painters can't come near it [the process] with their colours, and if they attempt a copy make us pay as many guineas as now we give shillings." On March 22nd Lord Percival mentioned that the company had suffered a good deal from mismanagement, but was nevertheless improving. A year later, however, there was a different tale to tell, which is conveyed by a letter from one D. Dering to Lord Percival, giving particulars of a meeting of the company on March 7th, when forty or fifty of the members were present, with Guise in the chair. A long account of the company's proceedings was read, and contained many reflections on Le Blon, each of which he characterised as a lie, "*Je declare que cela est faux.*" 490 shares of £15 each had been taken up, so that with what was due to the original promoters the liabilities amounted to about £9,000, of which £7,000 had been spent, £5,000 of it under Le Blon's direction, in the production of 4,000 prints, which, if sold at the prices fixed, would entail a loss of £2,000. One Guine was also producing prints for the company, but on a much more economical basis, as for £2,000 he had turned out 5,000 in ten months, and these, when sold, would bring in £1,600 profit.

Some change had probably been made in the process, as the report set out that with the twenty-five sets of plates in stock, by "the method they now use" there might be 14,000 more prints produced, which, with Guine's 5,000, would, if sold, bring in £12,000. Le Blon had obtained an English patent for his process in February, 1719-20, but no details of the invention are in existence, the so-called specification being

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merely a transcript of the entry on the Patent Roll. He seems, however, to have demonstrated his methods in public on more than one occasion. About 1722 (the British Museum catalogue dates it 1755 !) he published a work entitled *Coloritto, or the Harmony of Colouring in Painting*, a thin quarto volume, of which only a few copies were issued at a guinea each, containing an explanation of the colour scheme he had formulated on the basis of the Newtonian theory. It is illustrated by nine full-page plates, mezzotinted by Le Blon, but only two or three of these are in colour, his object in publishing the book being to explain, not the three-colour process, but the principles on which it depended. The work is not, however, very intelligible ; indeed, Dr. Singer (*Studio*, May, 1903) characterises it as silly. It was dedicated to Sir Robert Walpole, the chief political personage of the day at the English Court. His son Horace, the writer of the well-known *Letters*, states in his *Anecdotes of Painting* that he had seen Le Blon. If they met while the latter was in England, Horace was but a boy at the time, having been born in 1717 ; it is possible, however, that he may have seen Le Blon on the occasion of his visit to Paris in 1739. Anyhow, he refers to the engraver-printer as a "universal projector . . . either a dupe or a cheat, I think the former . . . as he was much of an enthusiast, perhaps, like most enthusiasts, he was both one and t'other."

Whether "a cheat" or not, Le Blon was certainly the cause of a good deal of money being lost by the members of his companies. In after years, he claimed to have lost £2,000 himself, but this may have been a mere empty boast, as George Vertue calls Le Blon "a man of forward spirit, tolerable assurance, and with a good tongue of his own." The members of the original syndicate naturally lauded his process to the skies, but the artists, as naturally, tried to consign it to a quite different locality. It is said that some of Le Blon's prints from pictures by Rubens and Van Dyck were sold for originals, perhaps by unscrupulous picture dealers.

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He prepared the designs for the engravers, and corrected their work, and had many printers, colourers and frame makers under his care as well. As for Colonel Guise, Vertue describes him as swearing at and bullying everybody, with the idea that he was thereby advancing the company's interests.

Le Blon had two strings to his bow, having also invented a process of reproducing pictures in tapestry. "The Picture Office" operated this, and at the meeting just referred to it was stated that although £950 had been expended in erecting buildings in the neighbourhood of the Mulberry Gardens at Chelsea, and putting down looms, the only result was the weaving of a picture of a child's head and a piece of silk, which might be worth £30. Under these circumstances, it is not surprising that a Committee was appointed to look into the affairs of the company, and report to the shareholders. What happened afterwards seems to have been that Le Blon was deprived of his post of Director, an artist named Prudhomme being appointed to succeed him. This must have been not later than October, 1722, but it seems likely that the company was in existence till a much later period, as Le Blon was wont to boast that, for four or five years after, they were unable to carry on the business properly without him. After his connection with "The Picture Office" had thus come to an end, he turned his attention to portrait-painting for a time. His colour prints, according to Walpole, were disposed of by a sort of lottery, but those who gained them as prizes found that very little value was set upon them by the public. Walpole, however, admits that they were "very tolerable copies" of the originals. Dr. Singer thinks that about fifty plates in all were engraved by the process, and that the average edition was about 200 copies. If this be so, then out of these 10,000 prints not more than about a hundred are known to have survived, though many more may exist, masquerading as oil paintings by the aid of a thick coating of varnish, as is the case with some of the few specimens preserved at the

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British Museum. Although the process lingered on in England for a number of years, with varying success, no book is known to have been illustrated by it. Mezzotinted plates were really too delicate for continuous work, and it was stated that after a number of copies had been taken off, the colour impressions became very faint. In his *Coloritto*, Le Blon mentions that he was engaged in preparing some plates for use in a work being got ready for the press by Dr. Andre, anatomical surgeon to George I, but the Doctor was mixed up with an alleged miraculous birth scandal at Guildford in 1727, and when the bubble burst his reputation was exploded with it, so that the book was never published.

This disappointment probably led Le Blon to try his hand at forming another company, for the purpose of exploiting his tapestry process. He accordingly petitioned the Crown for a patent in 1727, the warrant for which still exists in the British Museum (Add. MSS. 31626, fo. 175). This document authorised him to form his proposed company, so a fresh start was made; but the new concern, which intended to reproduce Raphael's Cartoons (at Hampton Court) in tapestry, met with the same fate as the old one. Nothing daunted, Le Blon, in 1731, tried to save his colour-printing process from extinction by inviting the Royal Society to test and report upon it. Mr. Mortimer, the Secretary, did so, and his remarks will be found in the Society's *Philosophical Transactions* for June in that year, but we learn hardly anything new from them, the matter consisting mostly of a description of the tapestry process. It was estimated that the engraved plates would stand 3,000 impressions being taken from them, which sounds absurd. This report probably did Le Blon no good, as it was now too late to revive the old schemes; the people who had supported him at the start were disgusted by the loss of their money, and in the end Le Blon, who was heavily in debt, saw that the game was up so far as this country was concerned, and so decided in 1732 to betake himself and his process across the water.

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He tried his fortune once more at the Hague, but with the same want of success as before, and by 1735 had moved on to Paris, where he was destined to spend his few remaining years in comparative peace. He seems to have made no more attempts to form companies, but took the precaution of patenting his process in France. In November, 1737, the Council of State agreed to give him a twenty years' monopoly of his three-colour method, and in the following April he was informed that his patent could be considered secure as soon as he had demonstrated his process to four Commissioners, one of whom was M. Gautier de Montdorge. Le Blon duly complied with the condition, and the Commissioners thought the process both tedious and expensive. A little circle of pupils gathered round the inventor, but only a few prints seem to have been produced in Paris by Le Blon himself, who died in poor circumstances in a hospital there in May, 1741. To some extent, his process may be said to have died with him, although it survived in various modified forms for another forty years. His own work, at any rate in the earlier years, seems to have been strictly on the three-colour basis, but there has been a good deal of controversy as to whether or not he used a fourth or black plate as a key for the colours. Mr. Mortimer's report stated that in cases where economy, beauty or speed was required, more than three plates were sometimes used. That Le Blon did so in Paris is almost certain, and he is said to have communicated details of this modification of the process to the Commissioners before whom he had previously demonstrated his methods. The genuine Le Blon three-colour prints bear, in the light or flesh tints, a striking resemblance to those of to-day, but in the dark shadows a little line engraving was occasionally resorted to, as well as in the hair in large pictures, such as the " Madonna," after Barocci ; this, like many others of his prints, was produced the full size of the original, *i.e.*, about 24 × 20 inches. The printed colours were occasionally supplemented by a little hand work in the eyes or lips, or as in the fine print

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of "Susanna and the Elders," where the water falling from the fountain is represented by broken lines of Chinese white. Other fine three-colour prints in almost pure mezzotint are those of the "Virgin and Child," after Caracci, and the portraits of Louis XV and Spenser the poet.

Le Blon being dead, his pupils soon began to squabble among themselves as to which of them was best entitled to wear the mantle of the deceased colour printer. The honour ultimately fell to, or was seized upon by, Jacques Gautier Dagoty, who was a native of Marseilles. Almost directly after Le Blon's death he petitioned the Council of State for a re-grant to himself of the patent for Le Blon's process, of which he said he had a better knowledge than anyone else. He obtained a thirty years' "Privilege" in September, 1741, and seems to have set to work at once under its protection. At first there is but little difference between his prints and Le Blon's, save for the introduction of the fourth plate, which was probably made a feature of the process as early as 1742, as the art is said, in one of the issues of the *Mercure de France* for that year, to have been "perfected." A fairly representative print of this period is the "Apollo," which in the imprint is said to have been "*composé et gravé en couleur par Jacques Gautier, seul privilegie du Roi*, 1743." There is a decided brown tinge about many of Dagoty's prints, and the point marks in the corners of the plates are often visible. In 1745, 1747 and 1748, three anatomical works were published by him, containing in all thirty-six plates printed by his process. A copy of the last was presented by the author to Louis XV, who, in September, 1749, gave him 600 livres, which was afterwards continued as an annual pension. In the same year Dagoty issued a pamphlet explanatory of his use of the fourth or black plate. His claim to be the improver and perfector of the Le Blon process formed the subject of some acrimonious correspondence in the *Mercure de France* in 1748-9, his opponent being an engraver named A. Robert, who had also been a pupil of Le Blon, and had just directed the

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attention of the King to a three-colour print engraved by himself, much to Dagoty's disgust. The latter had previously worked the process in partnership with Messrs. Viguier & Villars, Robert being with them in the capacity of employé, but the partners quarrelled, and in May, 1747, the partnership was dissolved by judicial decree.

Robert remained with Viguier & Villars, who still worked the Le Blon process by agreement with Dagoty, who started on his own account elsewhere in Paris. In 1750 Dagoty visited London in connection with the publication there of a Latin translation—*De optice errores Isaaci Newtonis*—of a work he had issued in Paris the year before, dealing with some alleged defects in Newton's theory of light and colour, for which he substituted one of his own ; any person who doubted the correctness of his statements could have them proved to him, with the aid of a prism that Dagoty had invented, on application to the bookseller (Cogan, of the Middle Temple), who got out the London edition of his treatise, which had been presented to the French Academy in 1749. Soon after, Dagoty commenced the publication of a sort of magazine, entitled *Observations sur l'Histoire Naturelle, sur la Physique et sur la Peinture*, of which eighteen parts, forming six quarto volumes, appeared in 1752-5. Fifty-three out of the sixty-three plates are printed in colours by Dagoty's process, but with two exceptions they show poor work, compared with Le Blon's, although the nature of the subjects, anatomical, botanical, etc., did not call for high art. The exceptions are a plate on the optics of painting in Volume I, in which the spectrum is printed in colours, as well as some other designs exhibiting gradations of the three primary colours, and a plate of two fishes in Volume II, which, although having some line work on it, is very good. In November, 1755, Dagoty informed the editor of the *Mercure de France* that he was the inventor of the art of printing pictures in colours with four plates, which he claimed to have found out at Marseilles before he knew Le Blon. Subsequently he went to Paris, and there met Father Castel,

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a Jesuit priest who had written a treatise on colour, and was persuaded by him to persevere with the process, but the existence of Le Blon's patent prevented him from following the advice at that time. As a matter of fact, both he and Le Blon seem to have been indebted to Castel for some useful hints.

Whilst Dagoty was thus boasting of his achievements as a colour printer, an unexpected opponent appeared in M. Gautier de Montdorge, one of the Commissioners before whom Le Blon had demonstrated his process in 1738. He published at Paris in 1756 a work which is usually referred to as the second edition of *Coloritto*, although the actual title was *L'Art d'Imprimer les Tableaux*. After the publisher's address to the reader comes a reprint of *Coloritto* in both the languages of the original, followed by some further details of the process, winding up with the statement (signed by Montdorge and another Commissioner) that Viguier was then working it on the lines laid down by Le Blon himself. Viguier had a share in the publication of the book, which was heralded by a revival of the epistolary controversy between Dagoty and Robert in the *Mercure de France*. From this it appears that Dagoty used five, six, or even seven colour plates on occasion, a method which Robert considered added to the expense without any corresponding benefit. Dagoty seems to have published a reply to Montdorge's assertions, but the writer has not seen it.

Out of all these claims and counter claims, and charges and counter charges, we manage to get a fairly clear idea of the nature of Le Blon's process. The different gradations of tint had, of course—in the absence of the ruled screens of our days,—to be dependent upon the manner in which the various plates were worked by the engraver, and the degree of graining given to them. If the plate were roughly grained, and the colour consequently sank into it deeply, a dark shade would be produced, whereas if it were only lightly scraped and the colour but slightly imbibed in consequence, a light impression would be the result. In the blue plate, for

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example, those parts that were to appear perfectly blue had to be left quite rough, but where the blue had to blend with the colour of another plate the surface had to be scraped more or less smooth, and where no blue at all was to appear it had to be polished to a degree of perfect smoothness, and so on with the other plates. The colours used for printing had to be transparent enough to show through one another, in order that the proper blending of tints might be obtained. They were ground with nut or poppy oil, and one-tenth of drying oil was added. Prussian blue, yellow ochre and red lake, the latter mixed with two parts of carmine, were usually employed. The best effect was produced when all three plates were used in immediate succession, *i.e.*, when the prints were completed one by one, instead of all of them being printed first in blue, then in yellow, and so on, as the colours blended more readily in a damp state.

From 1756, Dagoty seems to have remained undisturbed by his rivals. About ten years later he commenced the plates for a botanical work of his own, for which he obtained a six years' Privilege in March, 1767. It was entitled *Collection des Plantes Usuelles, Curieuses et Etrangeres*, and the plates are printed in colours by Dagoty's process. They are unusual in that the bluish background which had hitherto characterised his prints was in this book replaced by a fine irregular stipple, printed in black. The colour work is generally very poorly executed, and in parts supplemented by hand; red, green and blue are the usual colours, though occasional small patches of the first, and perhaps of the others also, have been added by a brush. Dagoty's practice of engraving his plates himself brought him into collision about this time with the Company of Copperplate Printers at Paris, which considered that its members ought to do all such work. His sons helped him in the preparation of his plates and books, and also brought out some publications on their own account. Armand E. Gautier Dagoty, the second son, was, if anything, a more efficient demonstrator of the Le Blon process than his father,

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the plates he did for Jadelet's *Anatomie* (Nancy, 1773) being much better examples of colour printing than those in any of the other works that have been mentioned. The volume is an imperial folio, and the first two plates, nude male and female figures, are really artistic conceptions, exhibiting the spirit of Le Blon's best work, though in the eyes and lips there is a little red put on by hand. The thirteen other plates, anatomical diagrams, are also good, and in all cases the dark olive-green background characteristic of some of Le Blon's pictures is substituted for the plain blue or stippled ones seen in prints by the elder Dagoty. The difference between the work of these two colour engravers is well illustrated by the very mediocre prints in the *Plantes Purgatives d'usage* (Paris, 1773), got out by Dagoty *père*. This was intended to be an important publication, but only Part I, with eight plates, appeared; the prints have the usual blue background, and are of a very decadent order, the smudgy mezzotinted colour being eked out by some line engraving and hand-colouring.

Dagoty's fifth son, Gautier Fabien, also worked the family colour printing process, and seems to have banished the last vestige of art from it. In 1781 he got out at Paris the first (and only) part of a *Histoire Naturelle*, which contains fifty-nine plates engraved and printed in colours. The writer has not been able to see a copy, but if the plates are anything like those the same engraver did for a work of Desfontaine's on *Crystalographie* (Paris, 1790), they are not worth troubling about. In these, the background and the detail are mostly in line, with a little mezzotinting; black and brown are the only printed colours, the others being added by hand. Considered as colour prints, they are wretched productions.

Dagoty *père* died at Paris in 1785, two years after one of his sons, Edward Gautier Dagoty (born 1745), had closed his short life at Florence. The British Museum collection of Le Blon process prints includes a portrait of this son by Carlo Lasinio, in which he is styled the inventor of engraving

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in colours. There are also some separate colour prints by him, including one of " Leda and the Swan," a rather coarse-grain mezzotint, in which is seen the brownish tinge that appears in so many of the Dagoty family's prints. In one of his pictures—" A Sleeping Female," after Titian, dated 1780—the colouring of the drapery somewhat resembles that seen in chiaroscuro engravings. Of another print there is an impression in sepia as well as one in colours. In 1780 he issued a series of twelve plates after pictures in the collections of the Duke of Orleans and others.

Lasinio had the details of the colour printing process communicated to him by Edward Gautier Dagoty, and after the latter's death he practised it on his own account. There is a colour print by him of St. Mark, dated 1783, which rather looks as though it had been printed from a single plate, inked in colours in the then ordinary way. Lasinio has, however, left at least one remarkable monument of his perseverance, if not of his genius, in the shape of a collection of portraits of painters (*Ritratti de' Pittori*), engraved from the original pictures in the Royal Gallery at Florence. It is doubtful whether it was ever published in book form, though the set of upwards of 350 portraits is preserved at the British Museum bound in three quarto volumes, with MS. title and index, the former being dated Venice, 1789. There is a twelve-page printed list of the portraits bound in at the end of the last volume, from which it would appear that the prints were sold separately by the printer, Pietro Labrelis, at Florence. This particular set was once the property of Francisco Rizzo Paterol, an Italian nobleman, whose book-plates are in the volumes, and from his library they passed into the hands of a Venetian bookseller. The prints are all mezzotints, and (with the exception of one in sepia) are printed in colours, usually red, yellow and blue, as well as black, the latter furnishing most of the detail. Each print measures about 6 × 5 inches, and, though the engraving is rather coarsely done, the amount of labour bestowed upon the task must have been enormous,

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Reduced facsimile of three-colour mezzotint
(Portrait of Guido Reni. 1575-1642)
by Carlo Lasinio after E. G. Dagoty, from the "Ritrati de Pittori," Venice, 1789.

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seeing that considerably over a *thousand* colour plates were necessary. The colours are fairly bright, though the inks are rather muddy; most of the prints have a little extra colour added by hand. Little or no care seems to have been bestowed upon their finish, as the colour plates vary considerably in size, in many cases to the extent of nearly half an inch, a circumstance which gives a rather unsightly look to the margins. The names of the persons represented are roughly scribbled on tablets at the foot of the prints, which are arranged according to schools, Florentine, Venetian, etc.; or nations—French, English, etc. These pictures demonstrate clearly enough that Lasinio was not a great mezzotinter, as few of them rise above mediocrity. They are practically all half-lengths, the only full length seated figure being, curiously enough, a Scotchman, Joseph Macpherson. As a collection of unusual examples of colour printing, this is of some importance, and as a series of portraits it is very interesting, as so many men—and women—famous in the annals of art have their counterfeit presentments in these volumes, including Sir Joshua Reynolds, Sir Peter Lely, and other noted British artists. In Volume III occurs a portrait of Edward Gautier Dagoty, whom Lasinio again describes as the "inventor of engraving in colours."

A rather poor colour print exists of "The Holy Family in Repose," after Correggio, engraved by Louis Dagoty, probably another of the sons. The eldest son, Gautier Dagoty, was associated with his father in 1772 in the publication, at Paris, of a *Galerie Universelle* of celebrated living personages of all countries, only the first part of which, containing eight portraits, ever appeared. Amongst the portraits were those of Frederick II of Prussia, Voltaire, and the Duc de la Valliere, but they were rather a shoddy lot, with the printed colours supplemented by hand, so it is not at all surprising that the French public preferred ordinary line engravings to such poorly coloured stuff.

Apart from the Dagoty family and Lasinio, the only persons

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who are said to have produced engravings in colour in the Le Blon manner were Jan L'Admiral, a Dutchman, and J. Robert. There is a small frontispiece by the former to the *Dissertatio de Arteries* of B. S. Albini (Leyden, 1736), but in the copy the writer has seen, the printed colour is helped out by hand work. As to Robert, Tarin's *Adversaria Anatomica* (Paris, 1750) contains a number of line engravings by him, several of which are printed in red and black, but there is not the slightest trace of the Le Blon process in any of them.

In order not to disturb the thread of that portion of the narrative, the fortunes of the first three-colour process have been followed down to its final extinction, some forty years after its inventor's death. During that period many other events of interest or importance occurred in connection with the development of colour printing. So much having already been said with regard to the use of the mezzotinting process in the production of colour prints, this branch of the subject may be followed a little further.

A German botanical work commenced in Le Blon's later years, J. G. Weinmann's *Phytanthoza Iconographia*, contains a large number of plates partly printed in colour at a single impression, a method which was, perhaps, based on some experience or knowledge of what Le Blon had been doing, and may in its turn have furnished the elder Dagoty with the keynote for his own experiments in the same direction at a later period. The work in question was issued in eight folio volumes, at Ratisbon, between 1737 and 1745, and is illustrated by 1,025 copper plates of flowers and plants, a majority of which are engraved in line, though there are very many in mezzotint, this method being more particularly used in cases where a large engraved surface occurs, in representing broad-leaved plants, for instance. Some are depicted in pots, on the design and decoration of which the engraver spent a little more time than usual. There is generally one printed colour on a plate, in addition to that of the outlines, and sometimes

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two, but the presswork is largely supplemented by hand-colouring, although it often extends to the line-engraved portion as well as to that which is mezzotinted. The engravers of the plates were B. Senter, J. E. Ridinger, and J. J. Haid, of Augsburg, and according to a statement on the title-page (*Nitidissime aeri incisae et simul diu desiderata ac recens inventa arte vivis coloribus et iconibus*) these illustrations were printed in colours resembling those of the original plants, by a recently invented process; the stipple background that characterises Dagoty's botanical plates is absent in these. The same series of prints appeared in a Dutch edition of the work (*Dindelyke Vertoning*, etc.), published simultaneously at Amsterdam, from 1736 to 1748. This is distinguished by three fine plates in mezzotint by Haid, printed in blue, viz.: an emblematic frontispiece, representing the goddess Flora, and portraits of Weinmann and A. E. Bieler. The botanical plates were preserved for at least half-a-century, as Haid's son (?) republished them, with an engraved title-page in French, at Augsburg, in 1787.

About the time that Le Blon was engaged in his work for "The Picture Office," a young Yorkshireman, named Edward Kirkall (born at Sheffield about 1695), who had come up to London in 1718 and was first engaged in engraving small designs on metal, started producing colour prints in which mezzotinting provided the groundwork of the picture, but he only used a single mezzotinted plate, which furnished the shadows, the outlines being indicated by etching, which was done on the same plate. Then the tones were added by one or two wood blocks engraved in the chiaroscuro manner, so that the result was a compound print, both relief and intaglio methods being utilised. The pictures were much more spirited in effect than the ordinary chiaroscuro ones, the boldly-etched outlines and mezzotinted shadows combining well with the high lights, which stand out in low relief from the surface of the print, owing to the great pressure used in the application of the tone blocks to the paper, and to

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the deep holes that were cut in them; the "wash" shading is said to have been printed from pewter. Kirkall was very fond of engraving ornamental borders to his prints, most of them being furnished with something of the kind, generally printed from the tone blocks in the case of the chiaroscuros. Green seems to have been a favourite colour with this engraver, many of his pictures being printed in that tint; brown and brick red also occur in the chiaroscuros, most of which are engraved after pictures in famous collections of his day, such as those of the Duke of Devonshire and Dr. Mead. One specially interesting print is a reproduction (1722) of the chiaroscuro engraving by Ugo da Carpi in 1518, representing Æneas carrying his father from Troy; this is tinted from wood in yellow and brown, but in the black mezzotint impression, which was issued separately, there is more detail than in the mezzotint used for the colour print. Of the old style of chiaroscuro print, the writer has only come across one example by Kirkall, a small woodcut of a classical landscape, tinted in green and yellow from other wood blocks. Like the older engravers by the same process, Kirkall produced his chiaroscuros in more than one colour; that of a boar hunt, after C. Ferrea, for instance (1723), occurs in at least three states, *i.e.*, red, green, and reddish-brown. His prints were not very expensive, as in a filled-in copy of a receipt form he engraved (in mezzotint and chiaroscuro), he acknowledged the payment of a guinea, and engaged to deliver twelve prints in "claro-obscur," when ready, on receipt of another; nevertheless Walpole (*Cat. of Engravers*) says that Kirkall had "much success, much applause, and no imitators."

In addition to his work as an engraver in chiaroscuro, Kirkall published many prints in pure mezzotint, including a set of Hogarth's "Harlot's Progress," printed in green. A mezzotint of a "Storm Scene," after Van Huysum, is printed in two colours, green and brown, from a single plate at one impression, a rare and early example of a style of colour printing which became more common later in the century. The

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cost of producing the chiaroscuro-mezzotints—which necessitated at least one extra working—seems to have been about a third more than that of the ordinary mezzotints, as the latter were priced at £2 2s. for sixteen.

Kirkall's method of producing colour prints was imitated in France a few years afterwards by Nicholas Le Sueur (1690-1764). About 1725, an eminent art connoisseur, M. A. de Crozat, projected the publication at Paris of a series of copperplate reproductions of famous pictures in his own and other great French collections, including that of Louis XV. This was a very ambitious scheme, but, like many similar ones, came to a premature end after several years' work, only Volume I, consisting of two parts, being published; the title-page of the first part of this fine *Recueil d'Estampes* is dated 1729, but the second is supposed not to have been completed until 1742. In all, there are about 240 plates, in imperial folio size, including many double-page, and some thirty of these (most of which occur in Part I) were printed in colours in the chiaroscuro style, the rest being ordinary line engravings; only half a dozen are, however, produced solely from wood blocks, including the "Avenging Angel," after Tintoretto, and "Diana and Endymion," after S. Concu. In the other cases the outlines were lightly etched, and the colouring applied from wood blocks, after the manner of Kirkall. But as mezzotinting was not favoured in France, the engravers under whose direction Le Sueur worked made no use of that method in the preparation of these pictures, the shadows being represented by a second tone block and the lights by the first. Kirkall seems to have done all the necessary engraving for his colour prints himself, but Le Sueur was only responsible for the tone blocks of the Crozat pictures, the etched outlines being mostly by P. P. A. Robert (1686-1733), or that irrepressible amateur etcher, the Comte de Caylus (1692-1765). Some of the larger colour prints in this series, like Leonardo's "Day of Pentecost" and the "St. Prisca Baptised by St. Peter" of Baglioni, are fairly dignified examples of this style of art,

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whilst others, such as Bonnatti's " Saint Restoring a Blind Man's Sight," recall the early German chiaroscuros. Vincent Le Sueur (an uncle of Nicholas) engraved some of the wood blocks for the colour work, as in the print after Raphael's " Hercules." Green and brown, seemingly so inseparable from chiaroscuro work, are the tints most commonly used, but the " Sacrifice to Baal " is in red and blue, and in some prints three tints are seen. In a few cases the green colouring has faded at the sides of the picture to a muddy brown, this being particularly noticeable in some prints after Farinati's designs. In Part II there are two or three line engravings printed in ink of a yellowish or reddish tinge. The coloured prints are specially mentioned in the preface to the work, where also a short account of the history of engraving in chiaroscuro is given. From this we learn that the name then applied in Italy to pictures of this character was " three-colour prints " (*estampes de trois teintes*).

If Kirkall's work in England inspired that of the Le Sueurs in France, it is equally probable that theirs was in turn taken as a model by two contemporary English engravers, Arthur Pond (1705-1758), who was also a print collector, and C. Knapton (1700-1760). The former produced, about 1734-5, among other prints, a number of etchings, a few of which are in the " Bartolozzi red " tint ; several are after designs by Parmegiano, an artist whose work, it will be remembered, had furnished the earliest chiaroscuro engravers with models. Pond's reproductions are etched, the colouring being applied from wood blocks in the same way as in Le Sueur's prints, indeed there is very much in common, from a technical point of view, between the two sets of pictures, the colours used by Pond being similar to those of Le Sueur, bright greenish-blues and browns. Pond left directions in his will for the destruction of the blocks used for his prints, which were carried into effect by his executors. Knapton's prints, of the same period as Pond's, are also etchings tinted in chiaroscuro, but there is more detail in the etched work, as he

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largely affected landscapes after Claude, whereas Pond went in more for figure studies; Knapton's work, in fact, except for the absence of the colouring, rather reminds one of Jackson's style, and stands practically by itself at this particular period. His colouring, if it may be so termed, consists almost entirely of neutral tints, such as greyish-brown and light sepia; his inks, like some of Le Sueur's, seem not to have been very good, as in many cases they have caused discolouration of the print, with the result that a casual observer might take some of Knapton's pictures to be merely time-stained etchings, as the high lights are hardly indicated at all, except in the sky.

Both Pond and Knapton followed the example of the Le Sueurs in reproducing pictures in well-known collections; it is surprising how diffident all the early colour printers seem to have been in this respect. The "old masters," with a few modern ones, did duty again and again, the idea of producing some designs of their own apparently never occurring to the engravers in chiaroscuro. There are, of course, exceptions, but an original design for a print of this kind is somewhat of a rarity. Rogers, of the "Collection" to be mentioned hereafter, stated that a print in chiaroscuro by Stephen Slaughter, after Parmegiano, was the largest which, up to that period, had been produced in England, but what this refers to is uncertain. Slaughter was a portrait-painter who worked in Ireland about 1730-40, subsequently going to London, where he died in 1765. The only print by him that the writer has seen is an etched copy, dated 1733, of a drawing by Parmegiano in the collection of Dr. Hickman, to whom Slaughter dedicated it. It is partly tinted in brown from a wood block, in a style which suggests that it would have been better if Slaughter had left the etching to speak for itself.

These combination processes, in which etching and mezzotinting were called in to the aid of the old chiaroscuro method, nearly pushed the latter out of existence, although in the first half of the century, say from 1720 to 1740, a number of prints

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of the original type, *i.e.*, printed from wood blocks throughout, were produced by Count A. M. Zanetti of Venice (1680-1757). Technically considered, there was little to distinguish them from their earlier predecessors, the Italian style being naturally followed by this engraver, who is said to have revived the art of producing prints in the chiaroscuro style, as a result of his acquisition of some drawings by Raphael, Parmegiano, and other old Italian masters. In some of his prints, of which a collection was published in 1749, the black or outline blocks show more detail than is usual in chiaroscuro, there being much cross-hatching in the shadows. His son also engraved for prints in this manner, and a large picture produced by him in 1724, "The Discovery of the Cross by St. Helena," after Tintoretto, was dedicated to his father in a xylographic inscription beneath. This is probably rare, as it is not mentioned by Bartsch, but it has no technical peculiarity to distinguish it from other work of the kind.

Turning from these minor workers in the field of colour printing, we come to one who, though nearly forgotten now, obtained some little fame in his day, viz.: John Baptist Jackson, who was an Englishman, though his Christian names suggest Italian connections. Born at the commencement of the century, he was brought up as a wood engraver, possibly under Kirkall, and went to Paris about 1726, where he met the Le Sueurs, and according to his tale, instructed them how to produce prints in chiaroscuro on the lines he practised himself, besides assisting them with some of the drawings for the Crozat collection. He was also employed by Papillon, who accuses him of going behind his back to his customers and trying to sell them his own copies of cuts he had been engaged upon. After they parted, Jackson went the round of the Parisian wood engravers, offering his services at almost any price.

From Paris he went to Rome, thence to Venice about 1731, where he probably became acquainted with Count Zanetti, and had opportunities of seeing what had been done by the

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earlier Italian workers in the art of producing colour prints from wood blocks. He helped Joseph Smith, the British Consul at Venice, to get together his collection of books and prints, and to him one of his earliest Venetian prints, a small study of a female carrying a jar, dated 1731, was dedicated. It is of the usual type, printed in black on a yellowish ground, with the lights engraved out. A copy of Rembrandt's "Descent from the Cross," dated 1738, and also dedicated to Smith, shows a colour scheme of a more advanced character, there being three shades of brown, as well as grey and yellow, and the white lights are rather less in evidence. Through Smith, Jackson became acquainted with the British Ambassador to the Venetian Republic, Robert D'Arcy, Earl of Holderness; it was under this nobleman's patronage, and that of others whom Smith had induced to become subscribers, that Jackson, in 1744, produced a series of twenty-four prints in chiaroscuro, the subjects being, as usual, taken from designs by the old masters. These were of the ordinary Italian type, but a little later he published half a dozen landscapes in imitation of water-colours, *i.e.*, the usual neutral tints were abandoned in favour of bright colouring.

These were dedicated to Lord Holderness, and perhaps represented the result of Jackson's earliest efforts to produce genuine coloured pictures; there is, however, a crude ugly print (probably of his own designing) of the Dead Christ with attendant women, which may possibly be still earlier. It is of large size (about 12 × 14 inches) and is tinted in two shades of blue, a red, a brown, a flesh tint and a grey, but is an unpleasing amateurish kind of production; there is a copy in the Technical Library of the St. Bride Foundation. The landscapes, also most likely designed by himself, show rather better work. They are large pictures (24 × 16 inches) of the Italian classical type of the day, with groups of ruins, etc.; as regards the colouring, the most prominent tint is blue, which is applied freely to sky, hills and stonework; five or six colour blocks seem to have been generally used,

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although when Jackson was in Paris he contrived to obtain ten tints with only four blocks, no doubt by blending and superimposing the colours judiciously. He preferred to use the copperplate press for the production of his prints, and the great pressure to which the blocks were subjected has left its traces on the backs of the pictures, on which, too, the oil in the colours he used has left stains. These prints may be regarded as the first genuine ones printed in colours that were ever produced for public circulation by an English artist, although not in England. A few of Jackson's other pictures, such as the portrait of Algernon Sidney, have long inscriptions in large roman letters below, engraved in intaglio on the black block, which also carries a good deal of cross-hatched shadow, suggesting that it belongs to the earlier period. The portfolio of Jackson's colour prints at the British Museum contains a spirited design (about 36 × 20 inches) representing a battle scene, somewhat after the manner of the elder Rugendas. It is *sine nota*, and is altogether different from Jackson's other productions, both in style and colouring, so that it is probably not his at all.

He returned from Venice to England in 1746, and some time after conceived the idea of producing pictorial paperhangings, printed in colours by his process, perhaps finding but little sale for his prints. Wood engraving was then a debased, not to say despised art, and the public seems to have taken but little interest in anything in colour that was not the product of brush-work, whilst line engraving on copper was the only process thought much of, by the *dilettanti* of that day, for purposes of book illustration. Paperhangings of the ordinary sort had been but little used in the early part of the eighteenth century, except by the poorer classes, and the little colour decoration they possessed was mostly applied by hand in blotches from the surface of smooth wooden blocks, much in the same way as the prints in the Block Books of the middle of the fifteenth century are said to have been produced; in fact, Bagford, in one of his MSS., directly compares the two methods.

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As there was then no means of producing paper in continuous lengths, paperhangings were in twelve-yard-long " pieces," made by pasting several sheets together end to end, each sheet having a superficies of about a square yard, which was the unit on which this class of goods was taxed by the Excise ; the selling price was then from 1s. to 1s. 6d. a piece. One William Bailey obtained an English patent in 1692 for a method of printing paperhangings in colours, but the details of his process are unknown. Many books printed in the first half of the eighteenth century have, as end papers, pieces of figured designs printed in colours, which probably represent the paperhanging material of the period. The design is usually continuous, the same block being applied repeatedly until the entire surface of the sheet was coloured. Some of the designs are of a geometrical character, in two colours, like those seen on the cheap papers of our day, but others were of a more elaborate " rococo " order, printed in three or four tints, often red, yellow, purple and brown, with a stippled background engraved on one of the blocks. There was not usually any outline block, the design being built up from the successive colour impressions. The better class papers had a gold ground, on which the design was printed in a single colour in slight relief, further colour being frequently applied in irregular patches by a pad or brush. These interesting examples of early colour printing from blocks merit more attention than has yet been bestowed upon them.

Returning now to Jackson, we find that he set up a factory at Battersea for the production of his pictorial paperhangings, and, in 1754, published an *Essay on Engraving and Printing in Chiaroscuro*, in order to direct public attention to it. In the King's Library at the British Museum a copy of this book is shown, with an inscription denoting that it was the first work, published in England, that was illustrated with coloured pictures. In a sense this is true, although Le Blon's *Coloritto* of thirty years before should have been borne in mind. Jackson writes in the third person, and gives only twenty pages

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of letterpress matter, with eight plates; four of these latter are chiaroscuro prints in various brown and yellow tints, a bust of Democritus, a statue of Apollo, etc., good of their kind, but in no way out of the ordinary. They are, however, much better productions than the four coloured prints, which are really wretched things, though some allowance must be made for the discolouration caused by the oil in the colours, as Jackson took credit for the way in which the substance of the paper was impregnated with the oil, as compared with the volatile nature of water-colours. The book contains a few brief allusions to chiaroscuro work in general, but more to Jackson's own, and he claimed that the Italian method had not been attempted by anyone else since the beginning of the sixteenth century, a statement which does not say much for his knowledge of the subject. The production of "lasting and genteel furniture," as he termed his wall-papers, seems to have been conducted on a fairly large scale, as some fifty hands were employed. The colours were applied on a tinted ground, and the subjects were often bordered, *à la* Kirkall. Horace Walpole mentions the matter in one of his letters, but ridiculed Jackson's idea of decorating wall-paper with reproductions of designs by Titian and other old masters. He refers also to some "Gothic" paper, the panels of which Bentley had promised to paint for him; this suggests that he did not much care for the colour-printed sort, though he liked the Italian landscapes.

Jackson's scheme was not successful, possibly owing to the fact that the old method of printing paperhangings from blocks was considered to be too slow and unsatisfactory. In 1764, J. Fryer patented the present one of printing in colours from engraved copper cylinders, which were placed in a press, though as late as 1786 J. Bunnett proposed the use of wooden cylinders. In his later years, Jackson was at Newcastle-on-Tyne, where he met Thos. Bewick, the wood engraver, to whom he gave samples of his prints and a drawing of the press by which they were produced, at the same time telling him that he had been

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patronised by the King of France (Louis XV); but Bewick does not seem to have been much impressed with this boast, as he says of the prints that "in my opinion none of them looked well." As he also refers to them as Scripture subjects after the old masters, printed from two or three blocks, they were, perhaps, some of Jackson's earlier prints in chiaroscuro. His later methods were apparently still practised by others, as Bewick mentions having seen wood blocks printed in colours by paper-stainers, so as to almost equal good paintings, "which leads me to wish that this method could be pursued" for the embellishment of the homes of the people. Referring again to Jackson, he says that when he left Newcastle he was "enfeebled with age," and that he ended his days in an asylum (he probably meant a refuge or shelter, not a mad-house) under the care of Sir Gilbert Elliott, Bart., at some place on the Border, near the Teviot or on Tweedside; this is supposed to have been in 1780.

Notwithstanding what Jackson says in his *Essay*, the art of engraving and printing in chiaroscuro did not begin and end with him, even in the eighteenth century, as several other artists practised it. C. W. E. Dietrich (1712-1774), the well-known German etcher and painter to the Court of Saxony, was one of them, though the writer has only seen a single production of his in this style, a study of a beggar, printed in black and two shades of brown, and dated 1757.

Next comes a Frenchman, J. M. B. Papillon (1698-17—), best known in this line by his *Traite Historique et Pratique de la Graveur en Bois*, published at Paris in 1766, in two octavo volumes. A translation of that part of the work which relates to engraving and printing in chiaroscuro will be found in Savage's *Decorative Printing*, in which also some of Papillon's "history" appears, but this is now mostly discredited. In the second volume is a progressive series of five plates, illustrating the steps necessary in the production of a print in chiaroscuro; first there is the green ground, with the lights engraved out, next an impression from a yellow-brown block, followed by

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one in red-brown, after which is the black outline block, a copy of the finished print completing the series. Here we can study a chiaroscuro print in the making, an advantage seldom offered by examples in collections.

The last of the old school of engravers in chiaroscuro was an English amateur, John Skippe, of Ledbury, who was educated at Merton College, Oxford, and afterwards studied art under Vernet. Apart from his prints, he is almost entirely unknown to fame. Recent though his period is, his productions appear to be very scarce, being probably mostly circulated amongst his friends. Chatto, who was almost a contemporary, knew of but three prints in chiaroscuro by Skippe; Hardie speaks of a "First" and a "Second" Part of some otherwise untitled series, dated 1781, each part "containing ten prints engraven in chiaroscuro." The writer has a folio volume of contemporary date containing twenty-eight prints by Skippe, and as five of the twenty or so at the British Museum are not in his collection, Skippe must have done at least thirty-three, not a great output, considering it was spread over some forty years. The earlier ones are in brown, and a solid black background covers a good part of the print. A "Leda and the Swan" occurs in this series, one of which (in the British Museum), is dated on the back in MS., "No. 3, November 30th, 1770," with the artist's autograph, and there is another, in the same style, of "Susanna and the Elders."

Skippe's prints are in the Italian manner, and fairly well done; as usual, the indispensable "Old Masters" furnished the designs, several of them being after Parmegiano. The first print in the writer's collection is, perhaps, the general title to the two sets Mr. Hardie refers to; the lettering is in Latin, printed from type, and reads (translation): "The following pictures, engraved on wood in hours of sportive leisure, in the endeavour to restore an almost lost art, are devoted and dedicated to his friends, and to every lover of the fine arts, by John Skippe, who is only anxious to obtain their favour and patronage. 1781." The date is not printed, but has

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been stamped in by hand afterwards, and as most of the prints that follow are dated 1782 and 1783, Skippe probably made up collections from time to time for his friends, dating the general title as required. From the dedicatory inscriptions below the prints, we learn that among these friends were Benjamin Blayney, B.D., Sir James Edwards, Sir John Strange (British Ambassador to Venice), Sir John Lawe, J. B. Malchair, and John Symonds, LL.D., Regius Professor of History at Cambridge. A few of the prints are dated 1809, but are not so good as the earlier ones, some of which appear to have been re-engraved at the later date. Two large designs, after Bandinelli and Michael Angelo respectively (1782), were engraved in outline only, and printed in brown ink on pink and on blue paper, with good effect. Three or four tone blocks were generally used in Skippe's prints, mostly browns, ochres, or olive greens in various shades ; the dedications were engraved on copperplate, and printed separately on a slip of plain paper.

When Skippe died, the art of producing prints in the original chiaroscuro style may be said to have expired with him, there having been no attempt at a genuine revival since his day. Between the Skippe and Savage periods came Fried. W. Gubitz (1786-1870), a German wood engraver, who showed a liking for colouring of a more modern type than that of the average chiaroscurist. Thos. Bewick refers to him in his *Memoirs*. Gubitz had sent some specimens of his chromoxylographic work, which Bewick greatly admired, considering them " like beautiful little paintings, they might indeed be said to be perfection." Examples of his colour prints do not seem at all common ; the British Museum has only one, a portrait of a German lady, in eight states or printings. As regards brilliancy of colour, it stands, like the date at which it was most probably produced, midway between the eighteenth and nineteenth century styles of wood block colour prints.

In Chatto & Jackson's book on the history of engraving on wood is a long account of a colour print of " Christ and

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a Globe," which bore the date of 1543, and was attributed to L. Cranach, on the evidence of a device supposed to be his. It was printed from about ten blocks, which is in itself a sufficient indication that it did not date from so early a period, in fact Chatto himself doubted it, and was inclined to consider the print (which then belonged to Branston, the London wood engraver) as the work of a German engraver named Unger, who flourished late in the eighteenth century. It was shown at the Caxton Exhibition in 1877, and was then attributed to Gubitz, who held the post of Professor of wood engraving at the Royal Prussian Academy of Art.

One occasionally comes across a comparatively modern book reminiscent of the old manner. An edition of Wordsworth's *Pictorial Greece*, published by Orr in 1856, contains a large number of woodcuts printed in black on a light ochre-tinted ground, the lights being in most cases engraved out. About the same time, or perhaps a little earlier, a series of oblong folio woodcut Bible illustrations by a German artist, J. Schnorr, were re-issued by a London publisher, with the addition of two tone blocks, a reddish-brown and a bluish-green, to each ; the block for the brown also carried a broad decorative border extending round three sides of the picture, as well as the ornamental design below the lettering at the bottom. There is nothing to indicate who was the engraver or printer, but these prints are of a decidedly original type, and of interest as constituting a sort of connecting link between the old workers in chiaroscuro, like Skippe, and the new, such as Evans or Leighton. A fourth colour was obtained in places by the two tone blocks being printed over each other. The illustrations to R. C. Trevelyan's *Polyphemus and other Poems* (1901) are printed in black and a single tone, the block for the latter having the lights engraved out, in a still more distinct approach to the ancient chiaroscuro style, though the designs, by R. E. Fry, lack the finish and vigour of the older ones. The pictures are accompanied by xylographic inscriptions, and the title-page, with its bold lettering and

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decorative border, is a not unpleasing piece of chiaroscuro colour work, refreshing as furnishing a variation from the almost universal " three-colour."

Charles Rogers' *Collection of Prints* in imitation of drawings (Lond., 1778) contains a large outline woodcut by Simon Watts, after the " Virgin " of L. Cambraso, printed in a yellowish-brown tone, and dated 1763. This obtained the premium which the Society of Arts had offered for the best engraving on wood, and is much in advance of the examples of that art seen in book illustrations of the period.

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CHAPTER IV

COLOUR PRINTING IN THE EIGHTEENTH CENTURY

SECTION II

INTAGLIO PRINTING PROCESSES; STIPPLE, AQUATINT, ETC.

THE relief printing processes for the production of colour prints having now been dealt with pretty fully, so far as the century under notice is concerned, we may turn to a consideration of those methods that depended upon the use of plates engraved in intaglio. Three of these, viz.: line engraving, etching, and mezzotinting, were older than the eighteenth century, and whilst the first-named never made any figure worth speaking of in connection with colour printing—save experimentally in the pages of Teyler's book—etching, though it was occasionally supplemented by colour printing, has only within the last few years come to take a prominent place as a primary method of producing coloured pictures.

The printing of mezzotinted plates in colours is essentially a late eighteenth century art, and in addition to it there were two other processes, invented in that century, which were utilised for colour work in the same way, *i.e.*, aquatinting and stipple engraving. Indeed, as Baron Portalis points out (*Gaz. des Beaux Arts*, 1888), whenever a new method of printing in black was invented, its introduction was speedily followed by its adaptation to colour printing. Stipple engraving may be regarded as the earlier of these two methods, and like mezzotint and aquatint is a "grain" process, the grain being formed of a series of dots, carefully arranged with

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reference to the planes and modelling of the subject. It constitutes a reversal of the criblé engraving already mentioned, and is, in a sense, a combination of etching and engraving, the dots being usually marked with a needle through an etching ground, bitten in by acid in the ordinary way, and afterwards added to and deepened with the burin. The method had its birth in attempts to imitate on the copper plate the texture, if we may use such a term, of the lines in a crayon drawing.

This is one of the very few inventions connected with the graphic arts which was not "made in Germany," as the first engraver to practise it was a Dutch goldsmith, Jean Lutma (1584-1669), who used a small hammer or punch—as do the engravers of copper cylinders for wall-paper printing at this day—to produce a sort of grain in his plates, not unlike that of aquatint in general appearance. Several engravings of his in this manner ("Opus Mallei") have come down to us, including a portrait bust of Tacitus, in which the hair resembles coarse stippling. The further improvement of this method is due to a Frenchman, Jean Chas. François (born at Nancy, 1717, died at Paris, 1769), who made his first experiments in this direction in 1740, but got no further than the production of a few proofs. The idea seems to have been then laid aside for some years, but in 1751 François revived it, and produced more proofs, none of which, however, were for public circulation. Among them was a large engraved facsimile of a drawing in red chalk after C. Vanloo, representing a "Corps du Garde." In 1756-7 he threw himself into the task in earnest, and brought his new method under the notice of the Royal Academy of Painting at Paris, who formally expressed their approval of it in November, 1757. This engraving "au manière crayon" attracted the notice of Louis XV, and François having explained and demonstrated his process, he was complimented with the title of "Engraver to the King," and what was more to the purpose, was granted an annual pension of 6,000 livres. Many of his early coloured stipple engravings were done to imitate drawings in black

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and white crayons on blue or grey paper. He next proceeded a step further in the scale of colour imitation, introducing a third plate to simulate red chalk lines. A number of stipple portraits in the crayon style appear in Volume II of Saverien's *Histoire des Philosophes Modernes* (Paris, 1761; in all the other volumes they are in black only); two plates were used, *i.e.*, for the red and the black parts respectively, but the effect can hardly be considered satisfactory, which fact perhaps led to a return to monotint in the succeeding volumes. The only edition the writer has seen is in 12mo, but in the Print Room at the British Museum is a proof of an aquatinted title-page to the same work in quarto, printed in brown, which was reproduced by Mrs. Frankau in her *Eighteenth Century Colour Prints*.

François was followed by Louis M. Bonnet (1743-1793), who is said to have engraved a thousand plates during his comparatively short life. He was a rather nomadic artist, going from Paris to St. Petersburg, from there to London, and then back to Paris, where he gratified his English customers by carrying on business *au magasin Anglais*, and still kept up a connection with England, through his London agent, Vivares. His first three-colour engraving *au manière crayon* was a portrait of a young girl after F. Boucher, a French painter and engraver of some note in his day, and was printed in black, red and white, a separate plate being used for each tint. Bonnet claimed that he alone possessed the secret of printing in white, but a contemporary (Varin) produced engravings on blue paper in the black crayon style, and heightened them with white. A characteristic pair of two-colour stipples by Bonnet, printed in black and red, are Jubier's "Les Pêcheurs" and "Les Laveuses," after Huet. A little later Bonnet added another plate to his series, to imitate blue chalk, an example of which occurs in his print of a "Young Woman Reading," after Boucher; female subjects and love scenes furnishing the material for most of his productions. Some female heads engraved by him after Leclerc were surrounded by a sort of

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frame, printed in gold. On some of these prints the invention of this method is ascribed to one Louis Marin, thought by some to be a pseudonym of Bonnet's, with the statement that it was first put into operation on November 11th, 1774. Bonnet explained and demonstrated his process, with the aid of eight colour plates, in *Le pastel en gravure, inventé et executé par Louis Bonnet* (Paris, 1769).

Another French engraver in the crayon style was Gilles Demarteau (born at Liege, 1722) who became a member of the French Academy in 1764, died in 1776, and was followed by his son of the same names. The elder Demarteau is credited with about 600 engravings of various kinds; so far as the coloured stipples are concerned, they were mostly in black and red only. Another worker in the same field was the Sieur Magny, by whom Gonord's portrait of J. D. L'Empereur was reproduced through the medium of this "new art," which he claimed to have invented. A Dutch engraver, J. J. Bijlaert (1734-1809), also practised the method, and published details of it in a pamphlet he issued at Leyden in 1772. He confined himself to two-colour plates, red and black.

The way having been thus prepared on the Continent, all was ready for the introduction of the new art into England, which is due to William Wynne Ryland (born in London, 1732) who, after a course of art instruction in his native land, went to Paris to perfect his education in that respect. During his stay in the gay French capital, the amusements and follies of which must have suited him well, and coming into frequent contact with Boucher, so many of whose designs were reproduced *au manière crayon*, the future candidate for Jack Ketch's attentions soon got to hear of, and to learn, that art; but he made no use of his knowledge at the time, or for many years after, as line was his forte, and moreover it better suited the English taste. After he settled down in London again, he received the appointment of Engraver to the King (George III) and an annual salary of £200; this must have been a mere drop in the ocean of the extravagances

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which his partiality for the fair sex led him into, and while casting about, like the Athenians of old, for some new thing, wherewith to rehabilitate his credit, he bethought himself of the crayon method of engraving he had learned in Paris long before.

About this time (*i.e.*, 1774-5) he had obtained an introduction to that gifted, if somewhat finical lady artist, Angelica Kauffman (born at Coire, in Switzerland, 1741, died at Rome, 1807), who had come to England some ten years before, under fashionable auspices, and was elected R.A. in 1768. She excelled in what the printsellers now term "decorative and fancy subjects," which needed some softer and tenderer mode of interpretation than either the hardness of line or the duskiness of mezzotint. Ryland tried his hand at reproducing one or two of her drawings in stipple, and they were both highly pleased with the result. When the new-fashioned prints were put on the market, the public expressed similar appreciation, and had Ryland only possessed a little strength of mind and steadiness of purpose, fame and fortune would have been assured. He opened a shop in the Strand, wherein the prints he engraved might be purchased, and for a time all went well with him.

The stipple engravings of Ryland and his contemporaries and successors in the art were very different from those of the early French engravers, whose productions were mostly limited to reproductions of crayon drawings in line, with a minimum of shading and detail, whereas Ryland and the other English followers of the new craze generally engraved over the whole surface of the plate, so that their application of the process enabled them to imitate a drawing in wash as well as one in line. Some of the earliest stipple engravings executed in England did, however, follow the original French manner, which could be fairly well imitated by etching in the "soft ground" style, and puncturing or rouletting the dots. In the *Collection of Prints* published by Rogers in 1778 are some two-colour etchings in stipple by Simon Watts, which were printed from two plates, one for each tint; the earliest

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(in Vol. II) is dated 1770, and is a portrait of Helena Forman, the second wife of Rubens. In this example the costume is in black line stipple, and the hands and face in red. In Volume I are reproductions in line stipple of Zucchero's portrait of Queen Elizabeth, and of a portrait of Robert Dudley, Earl of Leicester, which are dated 1773, and are of the same character as the other. But the style which Ryland practised came to prevail in the end, and was so distinctively English that engravings so executed were said in France to be *au manière Anglais*.

Ryland seems to have made no attempt at imitating the French method of engraving a special plate for each tone required in the production of a multi-colour print, preferring, instead, to ink a single plate in several colours with the aid of a stump brush. In this he had the assistance of an expert copperplate printer, Seigneuer, an Alsatian, who afterwards set up in business in that line on his own account. One great advantage of the new method was that it did away with the necessity of engraving specially for colour work, as the engraved design on the single plate, being quite complete in itself, could be inked for printing (*a*) in black, (*b*) in the reddish-brown tint so common to the stipple engravings of the period, or (*c*) in a number of colours.

The invention of the process must be chiefly credited to a London engraver, Robert Laurie (1749-1804), who communicated to the Society of Arts in 1776 a method of producing copperplate pictures in colours at a single impression, by inking the plate with stump brushes. He contemplated the use of plates engraved in a combination of mezzotint and stipple, with outline etching; his main idea seems to have been the production of book illustrations at a cheap rate. The Society awarded him a prize of thirty guineas. An engraved copperplate having been selected and cleaned, the printer was provided with a water-colour copy of the picture to be produced, in which the colour scheme was clearly indicated. A ground-tint ink was put on the plate first of all, usually brown,

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black or grey, which was not, however, allowed to get into the lines or dots of the picture, but simply to coat in a very slight degree the plain surface of the plate. The brighter colours, such as blue, red and green, were inked in next with a stump brush or piece of rag—*à la poupée*, as the French term it, the dabber used to apply the ink being shaped somewhat like a wooden doll (French, *poupée*)—each tint in its proper place, as shown in the water-colour the printer had before him; the flesh tint followed, the application of this being perhaps the most difficult part of the whole process, as in some cases a fresh ground tint had to be put on to receive it; last of all, the colours had to be blended or merged into one another at the points where the various tints met, in order to produce a perfect and harmonious result. Great care had, of course, to be taken that the colours did not get into any lines or dots in which they were not intended to appear, the "wiping" being fully as delicate and important an operation as the inking. In fact, the entire process was eminently one in which only a talented and sympathetic operator could produce the best results. The work of the artist, or the engraver, went for little if the picture was "botched" in printing, and thus the finest examples of this class of work are not necessarily the best engravings, but simply those in which most care has been bestowed on the inking and printing.

The process does not materially differ from that followed to-day for producing photogravures and other prints from intaglio plates in several colours at a single impression. The rate of production was necessarily very slow, as the whole cycle of operations had to be gone through afresh for every copy required. So far as the colouring was concerned, almost everything depended upon the skilfulness, or otherwise, with which the inking was done; a badly inked plate produced a smudgy impression, no matter how good the engraving itself might be. Even the most skilful inker, however, could rarely apply tiny patches of colour satisfactorily to minute

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details like eyes, lips, etc., and thus only a very small proportion of the eighteenth century engravings printed in colours are absolutely innocent of touching-up by hand.

The colour print now began, for the first time in the history of pictorial art, to be in public favour, there being almost as great a demand for them as there is to-day, having regard, of course, to the fact that the supply was vastly greater than it is now. The print collector then enjoyed the good fortune of being able to purchase these beautiful productions of the colour printer's art at a mere fraction of what is now asked for them. To Ryland, as to many other contemporary engravers, the prevalent rage for these prints brought in a small fortune, but in his case the money thus acquired was spent much faster than it was possible to earn it by legitimate means. An extravagant mistress and fashionable tastes and aspirations led to his forging a bill in order to procure more funds, and the offence being discovered he was arrested, tried and convicted, and like Dr. Dodd half a dozen years before, neither his position nor his talents could save him from a felon's death at Tyburn in 1783. Angelica Kauffman, too, had her unhappy love affairs, but ultimately married A. Zucchi, R.A., in 1781, and left London almost directly afterwards. Some years later, she settled in Rome, and there ended her days.

The void in that branch of the art world concerned with designing for stipple engraving, which her departure caused, was worthily filled by J. B. Cipriani (1727-1785)—who, after studying at Rome, came to England in 1755—whilst Ryland's mantle fell on the shoulders of Francis Bartolozzi, another Florentine, one of the most prolific engravers of that or any age, though it is doubtful whether he really engraved *in toto* the vast number of plates to which his name is attached, as even his long life would scarcely have sufficed for such a stupendous task. Born in 1725, the son of a goldsmith, his talents soon displayed themselves at the conclusion of his art training, and for some time he was employed by Joseph

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Wagner at Venice, engraving for various publications. In 1764 he came to London, and soon attracted the notice of the young King, George III, to whom he was appointed Engraver at a salary of £300; by 1768 he was an R.A. Line engraving was his branch for a few years, but when the craze for stipple engraving set in Bartolozzi was not slow to take advantage of it, and to appreciate its money-making powers. A large number of his stipples were produced in colours, but line engravings seem never to have been experimented with in that direction, though occasionally printed in red.

To write in detail of the stipple engravers whose productions were printed in colours, in the late eighteenth and early nineteenth centuries, would require a volume; from the view point of this book, however, such a task is not necessary, as to the colour printer one such print is very much like another, and such considerations as "states" may well be left to the dealer or the collector. In any case, an excellent and comprehensive account of "Old English Colour Prints," from the pen of Mr. Malcolm C. Salaman, formed the last Special Winter Number of *The Studio*, and as it also has the advantage of being fully and finely illustrated, the writer cannot do better than refer to its pages those of his readers who are desirous of knowing more about this interesting subject, and by way of excuse he may repeat Mr. Salaman's remark: "Of the stipple engravers who made pretty and attractive colour prints, their name is legion, while these pages are necessarily limited."

What has just been said about the printed multi-colour stipple engraving also applies to the engraving in mezzotint, which was treated in the same manner, at the period under notice, for the production of impressions in colour; it seems, however, to have been much less seldom used for this purpose than the stipples, probably for the reason that its surface was more delicate and thus liable to damage. Of the forty prints which Mr. Salaman reproduced to accompany his monograph just referred to, only three are mezzotints, all the rest being

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stipples, although the proportion of the one species to the other, so far as colour impressions are concerned, was probably not quite so small as this suggests. Mezzotints were sometimes produced in multi-colour by Continental engravers, such as J. P. Pickler (1765-1806) and F. Wrenck (17—1830), but these may be regarded as merely the exceptions which proved the rule that this branch of the colour printing art was distinctively English. As the use of the stump brush on a mezzotinted plate was not calculated to improve its surface, the colouring was seldom lavish, was indeed often employed in rather a niggardly fashion, even when the plates were expressly prepared for printing in colours. An example is afforded by J. Young's series of *Portraits of the Emperors of Turkey* (Lond., 1815), the history of which fine work is somewhat curious. In 1806 the Turkish Government consigned to its Ambassador in England a case of portraits of the Turkish Sovereigns, with instructions that they were to be placed in the hands of a competent engraver, for the purpose of reproduction; Young was entrusted with the work, and in the following year a specimen plate was despatched to Constantinople and approved of. On its return the other pictures were put in hand, but the deposition and death of Sultan Selim III led to the project being abandoned, and Young, consequently, found that all his time and labour would go for nothing, unless he could make some use of the plates himself; the Turkish Government ultimately consented to this, and the volume of portraits was the result. Only a very limited number of copies was produced, as the "process of colour printing tends so materially to injure the plates." Although it was stated that "the impressions have all been printed in colour from the pictures," there is in reality very little press colouring on them; the greater part of the surface is in black; the hands and face are printed in a flesh tint, and that part of the costume which required a broad mass of colour is usually printed also, but most of the other colour was put on by hand, it being seldom that more than two printed colours appear in a plate in addition

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to black. The frontispiece is in black, yellow and blue. Dr. Thornton's *New Illustration of the Sexual System* (of Linnæus), published in 1807, contains a few mezzotints partly printed in colour, but supplemented by much hand work. Most of the plates in that work are, however, aquatints, and as such will be referred to presently.

A few eighteenth or early nineteenth century engraved plates still exist, and are now and then used to produce copies for the benefit (?) of the tyro in print collecting; many other prints are reproduced in photogravure from original impressions, but in the case of stipples the reproductive process most commonly employed is lithography. Of such well-known prints as, for example, Wheatley's "Cries of London," there must be an almost constant flow of modern copies into the market. As a rule, these common imitations of stipple engravings are coloured by hand, but of late the chromo-lithographer seems to have cut into the work, and to have produced facsimiles from impressions in colours in such a way that the tints seem to run into one another at the edges, just as they do in genuine old colour prints, but the paper, the absolutely smooth surface, and the fresh look, combine to betray modernity, in spite of the usual presence of a dirty old frame, and a price about twenty-five times that of the cost of production. The late Mr. A. W. Tuer gave precise directions how to detect these modern-antique prints, but as they have greatly multiplied since his day, it can only be assumed that the ignorant are much more numerous than the knowing, in the ranks of old coloured print collectors.

Stipple engravings printed in colours were very rarely used as book illustrations, and mezzotints hardly at all, though in monochrome both were fairly common. The facility with which the same plate could be used for taking impressions of either description often led to a few copies of a particular work having the prints in one state, and all the rest in the other, or occasionally, as in the portrait of Linnæus in Thornton's *Sexual System*, the plate might be present in both states,

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though this was usually confined to special copies. One of the best-known collections in book form of stipple engravings in colours is the series of reproductions, by Bartolozzi, of Holbein's Portraits of Personages at the Court of Henry VIII, published in 1799 by J. Chamberlaine. The originals were drawn in outline with coloured chalks, hence the stipple reproductions were rather of the earlier French than of the later English type. The colouring was simple, a flesh pink for the face and hands and a brown for the hair or head-dress, in representing which line engraving was in part employed. It is a fine series of ninety plates, and for many people possesses far more interest than a collection of " fancy " subjects after Cipriani or Kauffman, with the stereotyped propitiatory grin on the faces of the nymphs and maidens, and the almost inseparable adjuncts of stringy drapery, flowers, lyres, etc. Hamilton, Adams & Co. reproduced the plates by lithography in 1884.

An edition of Gessner's *Death of Abel*, in the French translation of Hubert, published at Paris in 1793, contains six illustrations printed in colours at a single impression from stipple plates, which were engraved by Colbert, Casenave, and Clement, from designs by W. Monsiau. These are fairly representative examples of this style of chromography, and, in the British Museum copy at least, contain no colour that was not applied by the press. Several other books, beautifully illustrated in the same style, were published in Paris about this time—the most turbulent period of the Revolution. Among them may be mentioned a French version of Milton's *Paradise Lost*, with a dozen stipple engravings printed in colours after designs by Schall (1792); Florian's rendering of Cervantes' *Galatea* (1793), and Vade's *Œuvres Poissardes* (1796), each of which has four coloured stipples by Monsiau.

Some fine examples of colour printing from stippled plates appear in Tresham & Ottley's *Gallery of British Pictures* (1818), but, as in most works of this kind, it is almost impossible to find one which has not been more or less touched-up by hand. On a few of the plates, however, like F. Baroccio's

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" Madonna del Gatto," or G. Romano's " Holy Family," the amount of hand-colouring is small. The engravings were mostly executed by pupils of Bartolozzi, including P. W. Tomkins, Medland, Cardon, etc.

A stipple engraving, printed in colours, of that famous old London printer, Wm. Bowyer, by J. J. Chapman, was published in 1800. Amongst other engravers whose work was occasionally reproduced in colours may be mentioned Richard Earlom, S. W. Reynolds, Capt. W. Baillie, William Ward, James Ward, and J. R. Smith; the productions of the last three have provided subjects for a couple of interesting monographs by Mrs. Julia Frankau, published in 1904 and 1902 respectively. In each case the volume of text was accompanied by a portfolio of prints, which are of special interest as being actual stipples and mezzotints, not photogravure reproductions, as was the case in Mrs. Frankau's *Eighteenth Century Colour Prints*. Many of these fine modern copies of famous old engravings were printed in colours by the old method, and, needless to say, the publications in which these beautiful pictures were issued were expensive, but those who could afford to acquire them can boast of possessing practical illustrative evidence of the fact that the art of engraving on copper is not yet quite gone from us. Some excellent chromo-lithographed reproductions of eighteenth century colour prints appear in the posthumous " Autobiographica " of the late W. E. Vaughan, the Brighton print-dealer (1900).

The great period in the production of stipples and mezzotints in colours may be considered to have closed with the departure of Bartolozzi in 1802 for Lisbon, where he occupied the post of Director of the National Academy until his death, but colour prints of this character continued to be published until well into the nineteenth century, though an era of decadence soon set in. The *Fleurs Poetiques* of P. Denne-Baron (Paris, 1825) contains sixteen stipple engravings of flowers, printed in two or three colours at a single impression, rather a late example of the kind. Still later ones may be found in

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at least some copies of Capt. John Ross' *Second Voyage to the Arctic Regions*, (London, 1835); included amongst the illustrations are a few crude mezzotints, inscribed at the foot, "Printed in colours by C. Lahee." They are in two colours, black and blue, a third, red, being added by hand.

An example of a different kind is Emil Lecomte's *Melanges D'Ornements Divers* (Paris, 1838), which contains seventy-three full-page plates of decorative designs, of classical and renaissance types, twenty-four of them being printed in two or three colours, apparently worked into the lines by a stump brush or some similar method. Still later work of this description is seen in *Parables of Our Lord* (Lond., J. Mitchell, 1851). The line engravings, by Goodall after J. Franklin, are printed in black, that portion of the text which occurs on the same page being in Gothic letter, printed in red, with a large ornamental initial in blue. This arrangement alternates with full pages of text printed wholly in red, the initial in these cases being in black; the entire work was engraved, and the pages—each of which is surrounded by a red-line border—printed in two or three colours at a single impression, each part being inked separately by hand. The fad of producing coloured pictures on silk or satin, followed occasionally by the publishers of some of the illustrated papers of our day, had its counterpart in the eighteenth century, and one of J. Harding's engravings, "The Schoolmistress," was printed in colours on satin in 1792. The name of the actual printer of the pictures seldom appears on them. Mr. Salaman only mentions one, H. Floquet, 1789. One Gamble, a self-styled "Inventor of Printing in Colours," was carrying on business in Pall Mall in 1784, but of what the alleged invention consisted we cannot say.

Before proceeding to deal with other intaglio engravings in colours, something may be said about the "combination" processes used late in the eighteenth century and early in the nineteenth. The chiaroscuro-tinted etchings and mezzotints have already been referred to, and mezzotinted or aquatinted

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etchings naturally come next on the list for notice. The object of the engravers of these was apparently to produce from the metal surface of a single plate, or at the most from two plates, an effect similar to that for which the workers in chiaroscuro had to use a set of wood blocks. This could be done in more than one way; the plate could be lightly mezzotinted all over, or a "ground" that would take colour obtained by the use of sand, or the dusting box, to give a grain or tone. In any case the plate could be subsequently line-etched, and the ground tint scraped away in parts to a greater or lesser degree, as the nature of the design demanded, so that considerable variations in strength of colour could be obtained from a single plate, almost equal to those for which several wood blocks had hitherto been required.

Early examples of two-colour mezzotints of this type, dating from about the middle of the eighteenth century, are the reproductions by C. Rugendas, of Augsburg (1708-1781), of the spirited equestrian designs—mostly battle or camp scenes—of his father, G. P. Rugendas; in these, the lightly mezzotinted plate conveying the detail, which was in etched or engraved outline, was printed in black on a brown ground applied from a second plate, which was left clean in places in order to indicate the lights. It was, however, more common to use only a single colour to print ground and outlines together, the strong lines of the etching providing an effective contrast to the tone of the ground, now dark, now light, according to the extent to which it had been left polished or scraped or grained, the parts dealt with in the former way, of course, printing white.

Stefano Mulinari of Florence (1741-179–), engraved in this style, producing his prints in brown, green, and other colours, in imitation of drawings tinted in sepia or wash; he seems to have made considerable use of sand-grained or dust-ground plates to produce his effects in contrasting shades and tints of the same colour, and another Florentine engraver, A. Scacciati (born 1726) got his mainly by aquatinting his plates,

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which were printed in various tones of brown or ochre, some of them being surrounded with an etched frame or border, also tinted, after the style of Kirkall. Both of these engravers followed the usual practice of copying the designs of the Old Masters. A collection of prints published in 1762 contains many examples of work of this kind by Scacciati; amongst them may be mentioned "The Last Supper," after Eschauer, in brown line and tone, and the "Ascension of the Blessed Virgin Mary," after the picture by Salvator Rosa in the Florence Gallery, which is printed in green, and is much in the style of some of Le Sueur's chiaroscuro-tinted etchings in the Crozat series.

Bartolozzi did some prints for this collection, and the manner is seen reflected in some of his earlier English work, such, for instance, as the series of classical subjects he engraved in 1777 after Cipriani's designs, including "Minerva Visiting the Muses," "Vulcan and Venus," etc. These are line engravings, tinted in reddish-brown to deepen the shadows; some wash-drawings by Guercino were also imitated by Bartolozzi in similar fashion. Ryland produced many etchings with coloured grounds, good examples of which may be seen, as well as some by Bartolozzi and J. Basire, in Rogers' *Collection of Prints* already referred to. Several of these are in two or three shades of the same colour, usually brown or ochre. There are also a few by S. Watts, dated 1777, including "The Crucifixion," after Tintoretto, with a yellow "sand-grain" ground, on which the etching is printed in brown. A still more extensive collection of tinted etchings is R. Earlom's reproduction of the *Liber Veritatis* of Claude de Lorraine, published by Boydell in 1777, but as all the designs are uniformly printed in the same brown tone, they do not call for detailed notice here. The method survived until a later period, some engravings of classical subjects by N. X. Willemin (1763-1839) being printed in black on a solid background of vermilion; the actual engraving had a background of its own, which was cut away in those parts where

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the figures—very lightly engraved in outline—occurred. A very strong and crude contrast of light and shade was thus produced, of the character now sometimes termed "Rembrandtesque."

We come now to the latest of all the intaglio engraving processes which do not depend upon photography, *i.e.*, Aquatint. Although this method is often called "engraving," it is really etching by tones, for all the graving is done by acid, and thus there are, or need be, no lines, although these may be etched in. The plate is partially protected by specks of resin, and between these specks the acid bites, giving the plate an ink-holding capacity. Owing to the fineness of the grain, which varies according to the proportion of the resin and alcohol, a proof from an aquatint plate appears to the eye like a wash-drawing. The various tones are obtained by "stopping out," as in etching, *i.e.*, a fine grain is obtained by a single biting, after which the part intended to be left so is covered with a protecting coat of varnish, and the plate put in the acid again to obtain a deeper tone for the rest. The natural tendency of aquatint is to render the subject in flat tones, but these can, to some extent, be modified during the biting, and afterwards with the burnisher.

There are many ways of producing the aquatint ground, the two most important being the resinous dust ground and the spirit ground, the former containing the "ground" medium in powder, and the latter having it in solution, the liquid being afterwards got rid of by evaporation, leaving the specks of resin behind. The above is the process for preparing a plate for printing in a single colour, which is not necessarily black, aquatints in red, sage-green, brown, etc., being quite common. When more than one colour was required, the French aquatinters in most cases prepared a separate plate for each, which had only that part of the design etched upon it that was intended to be printed in a particular colour. Some designs, however, were of such a nature as to permit of two or more colours being printed at once from a single plate, the parts intended

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to carry the different tints being sufficiently distant from each other to allow of the various coloured inks being rubbed into them without any chance of their "running" together. Where separate plates were used, an extra plain one was commonly placed on the bed of the press, carrying a pin at each corner. The colour plates had corresponding holes at the corners, in which the pins fitted, so as to ensure that each plate fell exactly into the same position as the preceding one during the operation of printing. Sometimes all the colours were put on a single plate *à la poupée*, inks of a very thick consistency being used. In this case, the plates had to be carefully wiped in the usual way after the application of each colour, a thorough general wipe being given when they were all on. Aquatints printed in two or three shades are fairly common, but most of the elaborately tinted pictures said to have been aquatinted in colours show, on close examination, that the original printed tints have been supplemented by hand-work.

The invention of aquatint—which means water-colour, but had, in its inception, nothing to do with colour proper—is now generally ascribed to Jean Baptiste Le Prince, a French painter and engraver. Born at Metz in 1733, he studied art there, and subsequently went to Paris, in which city, after a residence of some years in Russia, he ultimately settled down, becoming a member of the Academy in 1765; he died in 1781. It has been stated that he derived his knowledge of the process from the Abbé Richard de Saint Non, a French author and amateur engraver, who certainly practised etching in aquatint, although it is unlikely that he was the actual inventor. Le Prince, in return for a pension of 1,200 livres, disclosed his method to the Académie de Peinture, in a MS. which they kept till 1788, when it was published in the *Encyclopédie Méthodique*. Fifteen years before this, one Stapart had published at Paris a treatise on *L'Art de Graver au Pinceau*, described as a new method. A German translation of it by Harempter appeared at Nuremberg in 1780.

The date of the first adaptation of the aquatint method

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to colour printing is uncertain, but would seem to be at least as early as 1768. At that time there was living at Amsterdam an ex-merchant, J. C. Ploos van Amstel (1726-98), who had turned amateur engraver and print collector. He amused himself by producing some aquatints in colour, and considered his work in this direction to be of such importance as to warrant him giving a public demonstration of his methods, in order to dispel any doubts which may have existed as to the precise nature thereof. This took place in October, 1768, in the presence of the Burgomaster of Amsterdam, that worthy subsequently publishing a testimony to the genuineness of Amstel's claims to be a producer, by a new method, of "prints in oil colours, with the aid of ground varnishes, powder, and liquids." This vague description does not help to an understanding of what Amstel actually did, nor do such of his productions as the writer has seen. He styled himself an "inventor" in a plate published in February, 1765, dedicated to John Witsen; a line engraving of a monumental stele, printed in dark brown on a light brown ground, with the lights engraved out, not unlike some of the old prints in chiaroscuro. He seems to have produced a fairly large number of aquatints in imitation of wash-drawings, but apart from the variation in grey or neutral tones produced by the use of grounds of different degrees of fineness, there is not much that can be dignified with the name of colour printing, though there is a good deal of hand-colouring on some of his pictures, many of which have a sand or dust grain in addition; some of them resemble the crayon-stipple or mezzotinted-etching types of tone prints. Between 1764 and 1787 Amstel reproduced forty-six pictures by Dutch masters, printing about 350 copies of each, and endeavoured to keep his process secret, even his apprentice being bound over in a sum of 3,000 florins not to divulge any of the details, though this arrangement speedily proved unworkable, like most of its kind.

In 1821 a *Collection d'imitations* of drawings aquatinted by Amstel was published in London by C. Josi, a relative of the

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engraver, who had intended bringing it out long before, but was prevented by the disturbed state of Europe and the consequent lack of interest in costly publishing enterprises. This is a splendid work, but it cannot be said that an examination of it tends to dispel the mystery which seems to envelop Amstel's method even to this day. Most of the illustrations are printed in shades of brown or sepia, or in the crayon style, but there are several fine prints in colours, including the first four, after pictures by A. Van Ostade; these have some resemblance to the work of Debucourt or Janinet, but considered as colour prints they are better productions than the French ones. There is more than a suspicion of mezzotinting about some of them, as well as of stippling, but whilst it is tolerably certain that most of the colouring was printed, it is almost as certain that some was applied by hand; it seems likely, too, that the coloured grounds were laid down on the paper before most of the detail—in black—was printed. The imitations of some drawings by Rembrandt, in brown and sepia, are undoubtedly press-coloured, as well as a few of those that immediately follow. The large plate after Lucas van Leyden, in brown, suggests a line etching, supplemented by aquatinted tones. Among other things, Amstel reproduced the original design for Bloemaert's chiaroscuro of the "Virgin and Infant Christ," which was referred to in the previous chapter; this was printed in brown, with the lights in white. There is also a woman's head, after Goltz, in red and black in the crayon stipple manner, apparently from two plates.

Aquatinting was introduced into England through the instrumentality of the Hon. Charles Greville, a member of the Warwick family, who, during a visit to Paris, purchased from Le Prince the details of his method, which on his return to England about 1761 he communicated to his friend Paul Sandby, the engraver (1725-1809), who seems to have modified and improved it. The earlier English aquatints, however, are generally monochromes, brown or bistre being the most

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usual colour, as in Sandby's "Views of Windsor Castle," 1776. It was not until the days of F. C. Lewis, some thirty years later, that English colour aquatints began to make their appearance; we have therefore to fall back upon French work as furnishing the earliest and best exposition of aquatinting in colours. Louis Bonnet, who has been referred to in connection with coloured crayon stipple work, also tried his hand at aquatint, and with a good share of success, an excellent example being his engraving after J. B. Huet's "Silence of Venus," in which five colours seem to have been used, viz.: red, flesh, grey, light brown and blue.

The most able French exponent of the art of aquatinting in colours was P. L. Debucourt (1755-1832), who held the post of painter to that unfortunate monarch, Louis XVI. He was the actual designer, as well as etcher, of most of his own prints, in contradistinction to his French contemporaries and successors, who chiefly contented themselves with engraving after other artists. The years immediately preceding the Revolution were those in which Debucourt produced some of his best work in this line, and he satirised the follies and fashions of the time, without any of the coarseness and exaggeration of Rowlandson. His "Promenade in the Gallery of the Palais Royal," which was priced at 300 livres as early as 1787, is quite inimitable in the way it depicts the fashionable life of the French capital, a couple of years before the great upheaval. There, "all unconscious of their fate," we see the "victims play," though even then they were walking on the brink of a precipice, over which the irresistible force of democracy was soon to hurl them; quite apart from its merits as a faithful picture of life and manners, this print is a fine specimen of that form of colour work which has made its engraver famous. About five or six moderately bright colours were used, each being printed from a separate plate; most of the detail of the picture was, however, etched on one plate only, the function of the others being chiefly to colour the impression from this key plate. Like all the workers in this

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department of colour printing, Debucourt used very fine "grounds," with here and there a suggestion of mezzotinting. In fact some of these colour aquatints give one the impression of a mezzotint "watered" down; even the most trifling details, such as the coloured pattern of a dress, are printed, so that if the colour plates were really aquatinted, and not engraved, Debucourt must have been a veritable master of that art. His "New Year's Day" (1787), and "A Visit to Grandma" (1788), ovals, are pictures of a different type from the fashion series, the spandrels or spaces at the angles of the square plate being filled in with an imitation of the markings of bluish-veined marble, a style which Alix also affected, as may be seen in his print of "Fortune." The colours used are brown, blue, black, grey and flesh. In a series of prints illustrating Russian peasant life, "The Droschki," etc., the colours seem to have been printed together at a single impression from only one plate. Another and later series, after Carl Vernet, is hand-coloured.

P. M. Alix (1752-1817), who was a contemporary of Debucourt, and a neat, clean, colourist, has left much good work of this character behind him, including a portrait of Charlotte Corday, the assassin of Marat, in which even the blue in the eyes is printed. He made a speciality of portraiture, and excelled in it more than in the accessory details which made up some of his pictures. In the portrait said to be that of M. Malesherbes, (the defender of Louis XVI), for instance, whilst the face is well done, the leaves on the trees are like bunches of bananas. Among his other prints is a large view of Old Westminster Bridge, published at Paris in 1799.

The multi-colour French aquatint is perhaps seen at its best in the productions of J. F. Janinet (1752-1813). It is curious that all these masters of colour aquatinting should have been born within a year or so of each other, and that they should all have survived the terrors of the Revolution and the quarter-of-a-century of incessant war which followed. In his print of "The Operation," Janinet described himself

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as the first aquatinter in colours, and the only person who was able to engrave in imitation of wash-drawings, whence the French term for the process, *au manière lavis*. To some extent he copied Bonnet's style, by producing some black and tint crayon-stipple prints, such as the pair representing "Le Berger Couronné" and "La Bergere Couronné," but it is by his colour aquatints that he is best known to-day. One of his masterpieces in this direction is the portrait of Marie Antoinette, who is represented in all the regal splendour which was soon to be torn from her; this is a beautiful piece of colour work, bordered with a frame of cartouche type printed in gold, and ornamented with wreaths and festoons of flowers, the blue-veined marble ornament appearing here also, the tablet with the inscription being in brown. For a short time in 1784 Janinet was bitten with the craze of ballooning, which was just as novel then as aviation is now, but as his much advertised experiments only resulted in ridicule, he returned to his studio again. From some of his prints we learn the names of those who printed them; Blin, Chapuis, J. C. Sergent *fils* (on the "Child with Dog" print), etc. One of Janinet's best "fancy" subjects is "The Three Graces," after Pellegrini. About 1873 a portfolio of proofs of his colour aquatints was discovered in Alsace, the prints in which were dispersed at long prices.

Next comes Charles M. Descourtis (1753-1820), a pupil of Janinet, and a fine colourist, though not remarkable as a draughtsman or designer. His "L'Amant Surpris," after Schall, is a really good piece of colour printing, and the same may be said of the series of prints, also after Schall, illustrating scenes from "Paul et Virginie," a work then in the zenith of its popularity; five or six colour plates were used to produce these. Some of the aquatinters in colour were probably indebted for the grain of their tone plates to the roulette, invented about 1762 by F. P. Charpentier, of Blois, for the purpose of putting in gradations of light and shade on an etched plate. Prints produced by this means were, however,

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usually termed "Aquarelles," a title which reappeared in France nearly a century later in connection with reproductions of water-colours. Speaking generally, the three primary colours, red, blue and yellow, were used in combination with a black key plate to produce the French colour aquatints of the late eighteenth century, so that Le Blon's method had been adapted from the old mezzotinting to the new etching process.

The best period in the production of French colour aquatints had practically ended before the English one began; but there was no comparison between the two countries in this respect, hardly any aquatints being printed in England in more than two colours, and not many with even that meagre number. A few designs by Adam Buck were reproduced in aquatint, and issued in colours in a style somewhat resembling that of the French prints. Several were published by William Holland, and amongst them may be mentioned "Tambourina," a reclining female with a tambourine, engraved by Wright & Ziegler in 1799, in which there is a flesh tint and two or three tones of brown. "Vespers" (1802), by Platt & Lewis, is a four-colour print of a rather different style, in which red, blue, and flesh pink appear as printed colours, besides the usual greyish-brown tone. A pair of earlier prints, engraved by F. Jukes after W. Williams, "Courtship" and "Matrimony" (1787), were also issued in colours.

Perhaps the first, and certainly one of the best series of English productions of this kind, is Dr. Thornton's *Temple of Flora*, as it was first announced in 1799, or *New Illustration of the Sexual System*, as it was termed when it appeared in 1807, dedicated to Queen Charlotte, but shorn of some of its intended glory, owing to the general depression of publishing enterprises caused by the war. It is a fine volume, indeed one of the finest botanical works of any period, and all the plates are provided with artistic and carefully engraved backgrounds, hills, trees, rivers, etc., which are excellent examples of aquatinting, occasionally fortified by a little stippling

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or line engraving. In a few cases, such as "The Nodding Renealmia," three printed colours appear, but the English fashion of working from a single plate was mostly followed, not the French one of having a separate plate for each colour. The most common printed tints are green and blue, the latter being the sky colour and generally that of the hills. Red occurs as a printed colour here and there, one of the finest examples being the plate of the "Flowering Sensitive Plant," but in this case more than one plate must have been used, as the long red tendrils stand out in perceptible relief, clear of each other, and could not have been inked on the same plate as the printed background against which they are represented; it is curious, however, that the other red on the print should have been put in by hand.

The hand-coloured aquatint, as an ordinary book illustration, was in great favour during the first quarter of the nineteenth century, especially in the works published by Ackermann, who, although he showed decided leanings towards lithography at first, ultimately hit upon aquatint as a means of interpreting the designs of the numerous artists who drew for his books. This is a phase of illustrative art with which we are not concerned here, but long lists of books containing hand-coloured aquatints will be found in Hardie's *English Coloured Books* and Miss Prideaux's *Aquatint Engraving*.

The press-coloured aquatint made its appearance much more rarely in books, being more common in the form of separate prints, but in either case the usual practice was to etch the plates in broad masses of light and shade, avoiding much minute detail, and then to ink them in two colours, generally sepia and green or brown, so that each print could be produced at a single impression. Examples occur in some views of Indian scenery, published by the Daniells in 1812; in a series of views of the Lake District, after T. Fielding, published by T. McLean in 1822, and in G. F. Phillips' *Practical Treatise on Drawing*, 1839.

These were on a small scale, but among the more expensively

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produced subscription volumes perhaps the finest display of aquatinting in colour, though not in multi-colour, is seen in W. Y. Ottley's *Collection of Facsimiles of Drawings by Old Masters* (1827), one of many similar works brought out about this period, some of which have already been mentioned. Most of the prints in this volume were aquatinted by F. C. Lewis (1779-1856), a pupil of J. C. Stadler, who himself occasionally aquatinted for colour work. The "Collection" contains aquatints printed in red, brown, yellow and grey, in fact, in all the tints usually affected for this class of print. In one case, perhaps as fine as any, a study of trees after Claude is printed in green; "The Finding of the Cross," after S. Pagani, the largest picture in the book, is in brown. There are a few line etchings on tinted grounds or in the crayon manner, and two or three others in which the shadows are chiefly represented by cross-hatched line work, put in so strongly as to produce a distinct impression on the back of the print. Somewhat similar work is seen in some engravings by A. Rancati, of Rome, published at Milan about this time, Michael Angelo's "Esaias," for example; here also the shading is put in by cross-hatched work, of a different type from that of Lewis, and printed over two ground tints, a light and a dark brown, the lights being scraped out,

J. T. Prestel (1739-1818), a German artist, did a few aquatints in this style; among them is a copy of one of Raphael's studies for his "School at Athens," dated 1785, an etching, printed on a yellowish-brown dust ground with the lights scraped out; and an etched reproduction of Ligozze's "Truth's Triumph over Envy," also printed on a brown ground, and tinted in two darker shades of brown, but the lights are indicated by an impression from a third block, which was printed in gold, an idea perhaps suggested by some early sixteenth century prints of Cranach and J. de Necker, referred to in Chapter II. A "Magdalene," after Correggio, was printed by Prestel in three shades of sepia, and colouring of a similar nature is seen in a large spirit-ground aquatint of St. Gallen's Tower of Frankfort.

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Prestel's best work in colour aquatint is seen in his collection of facsimiles of " Dessins des Meilleurs Peintres," from the collection of G. J. Schmidt at Hamburg (1779). All these are engraved the full size of the originals, and though many are in outline or in sepia tints, several are in two or three colours. There is very little of the dust ground in these prints, the characteristic spirit-ground grain being recognisable almost throughout; many of the pictures, except for the presence of this, would give one the impression that they are printed from wood blocks, so close is the resemblance to the old chiaroscuro work, and some of them, with the high lights represented by uncoloured white spaces, strongly suggest the style and colouring of Le Sueur, as seen in the Crozat collection. Green and sepia, or green and black, are favourite combinations, as also are brown, or red, and black, one example being in two shades of brown, two of green, and a bistre tint in addition, and a few in red and black stipple, in the crayon manner. This is a volume which should be compared with the Ottley collection of half-a-century later, previously mentioned.

The series of 100 illustrations to Hugford's Life of A. D. Gabbiani, the Florentine painter, published at Florence in 1762, are sometimes referred to as early examples of the use of aquatint in colour work. They are, however, more of the character of the mezzotinted etchings already alluded to, although the tones may have been produced by dust grounds. Many of the plates are by Scacciati, and some by Cipriani; Bartolozzi also helped. There are several line engravings printed in red, and a number of prints in the style usually affected by Scacciati, *i.e.*, etchings on a coloured ground, red, brown, yellow or greenish-grey. This collection, like Prestel's—though it is not, as is the latter, a one-man production—may be advantageously contrasted with a British one published fifty years after, viz.: J. Chamberlaine's series of facsimiles of " Original Designs " in the collection of George III (1812). This has numerous examples of aquatints in colour, though mostly only a single shade, which is usually

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red or brown. Some of the imitations of Caracci's designs, by W. Tomkins, are particularly good specimens of this class of work, as are also one or two after Claude, by F. C. Lewis, and some stipples by Bartolozzi after L. da Vinci, printed in red.

The decay of aquatint, as a book illustrative method, may almost be dated from the death, in 1834, of Rudolf Ackermann, who, by so extensively using it for his publications, had done much to keep it alive. It was succeeded by an era of etching, in which G. Cruikshank, Seymour, Buss, H. K. Browne and others loomed largely, so that by the middle of the last century aquatinting was almost laid aside.

Towards the close of the eighteenth century, what appears to have been a mechanical method of copying pictures in oil colours was invented by an artist named Joseph Booth, or possibly by Francis Eginton (1737-1805), but no reliable details of it have come to light. It was introduced in 1784, under the formidable name of "Pollaplasiasmos," which, two or three years later, was changed to "Polygraphy," and a Polygraphic Society was formed, that had its headquarters in Pall Mall, and held annual exhibitions of "Polygraphics," as these multi-colour reproductions were termed. The Society purchased a number of valuable original oil paintings for copying purposes, including a seaport view by Claude, costing 400 guineas, the Polygraphic copies of which measured 48 × 61 inches framed, and cost twenty guineas each. In most cases, however, "Polygraphics" were much cheaper than this; a hundred copies were made of a picture of "Jupiter and Europa" at three guineas each, and two and a half guineas seems to have been the minimum. The prints appear to have been furnished to the Society by Matthew Boulton, of the well-known Soho engineering firm, who is alleged to have dabbled in photography about this time. There is some evidence that "Polygraphics" were alternatively termed "Sun-Pictures," a term which Fox Talbot made use of sixty years later, but on the other hand Boulton spoke of the process as "printing" or "taking impressions," although Booth

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referred to it as a "chymical and mechanical" method. The details are, however, "wropt in mystery," though such as have survived suggest that many of the existing anonymous copies of old masters may be Polygraphics. Mr. Goddard, the principal man in the Society, died in 1794, the stock of original pictures and polygraphed copies being subsequently sold off and the concern wound up. In the absence of an authenticated Polygraphic it would be useless to speculate on the precise nature of the process. Those who are interested will, however, find it discussed at great length, though rather fruitlessly, in the *Journal* of the Photographic Society for November 16th, 1863, and January 15th, 1864.

Of letterpress or typographic printing in colours, not very much seems to have been done during the eighteenth century; work in red and black, other than on title-pages, was almost entirely confined to the service books of the Roman Church, and a large proportion of even these were printed in black only, though such establishments as the Plantin Press still produced creditable examples on the old lines. In the middle of the century, several editions were got out at Paris of a work entitled *Le Livre à la Mode*, a satirical description of the manners of the time. It was a 12mo volume, of which two editions were published in 1759, one printed wholly in red, the other in yellow. In 1760 there was another red edition, and then the work, which was in four sections, was re-issued with the title of *Le Livre de Quatre Couleurs*, the sections being respectively printed with green, yellow, red and brown ink. On the title-page lettering in all these colours appears, in addition to a vignette printed in black. In 1790, the year following the Revolution, the idea was revived by the publication of *Le Livre Rouge*, which contained a list of the secret pensions paid out of the French Treasury before the trouble came to a head, with rather "free" explanations why they were granted. As the title implies, this was printed wholly in red, and editions produced in similar style were issued the same year in London and in Dublin, the printer of the latter being

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probably M. Williamson, of Grafton Street, who seems also to have produced some books in green ink about this period, perhaps as a compliment to the Irish. The writer has found a reference to an edition of John Wilkes' *Essay on Woman*, printed in red in 1772, but has not seen it. In a tiny volume published at Paris in 1801, with the title of *Almanach des Quatre Couleurs*, the frontispiece and four other copperplate engravings were printed in blue, and the text in red, green, bistre and blue. G. de Boze's *Livre Jaune* (1748) and an edition of *Abelard et Héloise*, published at Paris in 1834, may be mentioned in passing as examples of the use of coloured papers in place of coloured inks, the last named having four shades.

A more than usually interesting example of typography in red and black is the edition of Justinian's *Institutes* printed at Paris in 1805, "*ex officina stereotypa Herhan*," this being perhaps the first occasion on which the art of stereotyping, then newly re-introduced, was utilised for the production of a book in two colours. It is in a small neat roman letter, and beautiful register is maintained throughout.

The weird publications of William Blake, the Lambeth printer-engraver-poet, may be included under the head of letterpress printing in colour, inasmuch as, like those of the old Block Books, each page of Blake's various volumes of poems was engraved, text and illustration together. Though the point will probably always remain in doubt, the press-colouring in Blake's books is most likely limited to that in which the text is printed, as seen in *The Book of Thel* and *The Songs of Innocence* (1789); *America, a Prophecy* (1793), usually produced in dark green; *Europe, a Prophecy* (1794), in olive-green; *The First Book of Urizen*, *The Song of Los* and *The Songs of Experience* (1794), all printed in shades of brown. Some of these are in monochrome without any retouching by hand, but in others the original printed colour has been greatly added to by brushwork. In *The Visions of the Daughters of Albion* (1793), this is in thin water-colour, but in *The Book of Los* it is rather in the nature of thick oil

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paint, applied over all the outline illustrations, and also in smeary patches at the sides of, or across the text, much in the same style as one would expect a child, in possession of a box of paints, to spoil a book, and tending to strengthen the idea that Blake was mentally afflicted. In the folio volume of reproductions of his works, published in 1876, the text and illustrations can be studied in monotint, as originally engraved and printed, but as the printers and colourists were Blake and his wife, nearly every copy exhibits points of difference. The plates used were, like the engraver himself, of a decidedly original character. In place of writing and drawing his text and illustrations in ink, Blake used an acid-resisting composition, with which he wrote and drew on the surface of the copper; then, when the designs were dry, aquafortis was poured over the plate, the surface of which, save where the lettering and pictures protected it, was eaten away. Thus Blake's plates were surface-printing etchings. It is as a designer of emblematic subjects that this remarkable artist is best known, and in that particular line it would be difficult to name his equal.

So much space having already been devoted to colour printing from wood blocks, an art that will have to be referred to again in the succeeding chapter, something may fittingly be said at this point about the Japanese colour prints, which, like the European, were printed from wood blocks, and, like them also, were the result of a development from hand-colouring. The art of engraving on wood, though doubtless of great antiquity in both China and Japan, did not attain its best period until late in the seventeenth century, when book illustrations along the so-called popular lines began to be introduced by the two Matabei, of whom the elder died in 1650, and their follower Moronobu (died 1714). Their work was in black and white, but hand-tinting in red became common early in the eighteenth century, and the next step, *i.e.*, to printing in colours, was first taken under the auspices of the followers of Torii Kiyonobu, who died in 1729; these including

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N. Shijenaga (1697-1756), who was the master of S. Harunobu, perhaps the first of the great Japanese producers of colour prints. He worked between 1764 and 1772, and, like Ryland in England, his style was immediately followed by quite a host of imitators, amongst whom may be singled out Utamaro, who carried on the succession from 1772 to 1789. His prints first gave rise to the craze for collecting these charming examples of colour work that has subsisted almost ever since. Tokoyuni (1769-1825) came next, and raised the art of colour printing in Japan to its highest level. For the greater part of his life he was contemporary with Hokusai (1760-1849), who, as a book illustrator as well as a producer of separate prints, stands unrivalled in Japanese annals; most of his prints were in three or four colours, as was then usual in Japan, but in his books, such as the famous *Mangwa*, a sort of pictorial encyclopædia of Japanese life and manners, black and red alone were used.

This colour printing, most of which was done at Yeddo, was quite unique of its kind; the design, being drawn on thin paper, was pasted face down on a block of pear wood, which was then engraved to serve as a key block, and from proofs of this the series of colour blocks was engraved. The actual printing was essentially a hand process, as no press was used, the paper being laid on the face of the inked block, and rubbed to transfer the impression. There was a sort of rudimentary point system in use, to secure accurate register. Tokoyuni's pupils, Kunisada and Kuniyoshi, carried on the work, along with a crowd of lesser artists, until the fifties, after which a period of decadence set in, more colour blocks being used, and imported colours of a rather gaudy character. By 1870 the old school of artists who worked for printing in colour was almost extinct, and the introduction of modern and Western ideas, which followed the regeneration of Japan in 1868, was responsible for quite a different class of work, which retained little of the genuine spirit of the old. Wood block colour prints—of a kind—are still produced in Japan, though

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but few care to collect them. The modern Japanese disciple of the graphic arts is rather fonder of something absolutely new, like collotype, hand-coloured examples of which process are quite common in Japan to-day. Even where an attempt is made to reproduce in some slight measure the old style, modernity is well to the fore, as in the series of little volumes published at Tokio a few years back under the title of *Japanese Fairy Tales*. These were printed on "crêpe" paper, quite a different material to the native article, and the black outlines of the pictures were crudely coloured, though probably from wood blocks, in flat masses, quite removed from the fine distinctive tinting of the prints of the old school. Coloured drawings by Japanese artists, on native lines, have occasionally been reproduced by up-to-date European methods, as in F. V. Dickins' translation of the Japanese romance, "Chushingura" (London, 1880), which includes some photo-litho reproductions, by Griggs, of Japanese coloured pictures. A publication which had a share of popularity a few years ago, *Artistic Japan*, contained many modern-antique Japanese prints in colour.

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CHAPTER V

COLOUR PRINTING IN THE NINETEENTH CENTURY

CHROMO-XYLOGRAPHY. PART I

SAVAGE AND HIS "DECORATIVE PRINTING"—BAXTER, HIS LICENSEES, AND HIS RIVALS—THE CHISWICK PRESS

THE first quarter of the nineteenth century witnessed the revival, in a new form, of the old chiaroscuro process, and also the introduction of an entirely fresh colour printing method, viz.: chromo-lithography.

We will deal with the former first, in this and the succeeding chapter. Like Teyler's, it is only known at the start through the medium of a single work, but whereas Teyler's career is veiled in almost total obscurity, the name of William Savage is known to many who have perhaps never seen his book on colour printing, as he was the author of some other and better known works connected with the trade.

Savage was a Yorkshireman, born at Howden in 1770, and twenty years later was in partnership there with his brother James as a bookseller and stationer. In 1797 he went to London, and a couple of years afterwards was appointed to take charge of the printing department of the Royal Institution. Having in this post plenty of spare time on his hands, he, in 1803, started a printing business on his own account, and was thus enabled to devote some of his leisure to experimental work in connection with the trade. His attention was specially directed to the want of coloured inks, which, a century ago, were scarcely to be had in England, and he set to work to remedy this deficiency. In contradistinction to Baxter's practice a quarter of a century later, Savage's ideal

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ink for colour printing was one which did not contain oil, he using balsam capivi and dried turpentine soap instead. Having succeeded in this direction, he hit on the idea of publishing a book, which should exhibit the application of his new coloured inks to letterpress work of a pictorial and decorative character, of a kind which had not hitherto been seen in England. On the cover of the *Gentleman's Magazine* for August, 1815, there appeared a sort of prospectus advertisement of the proposed book, which was to have the appropriate title of *Decorative Printing*, and be published by subscription, as was usual with any expensive work at that time, the price of a large paper copy being ten guineas, and of a small paper one, five guineas. Savage guaranteed that no second edition of the work should appear, as all the blocks were to be destroyed, which operation his subscribers could see him perform if they liked. His proposals for thus creating an artificial scarcity of the book were severely condemned by several writers in subsequent numbers of the *Gentleman's Magazine;* however, he got enough subscriptions (there are 227 names in the list) to justify him in proceeding with the enterprise, and accordingly obtained drawings, selected the subjects for the pictures, and had most of the engraving work done by well-known practitioners in that line. The illustrations to the book were to be mostly in colours, and all were to be printed from wood blocks, but some in bright tints instead of the neutral shades affected by the old school of chiaroscurists. The engravers whom he employed for the colour blocks (there are also several ordinary black-and-white illustrations) were very sceptical of the possibility of reproducing coloured drawings by the method Savage proposed, and as business in the wood engraving line was brisk just then, the progress of Savage's book was greatly retarded in various ways, not the least of which arose from the fact that he resolved to print nearly all the colour work himself, on an iron hand-press of the " Ruthven " type, then recently introduced by a person of that name in Edinburgh. What with one delay and another, three years

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passed away, and Savage was constantly bombarded with enquiries from his subscribers as to when the book was going to appear; in order to keep them quiet, he promised publication in November, 1818, but found it impossible to get the work finished by that time, so decided to issue what he had ready, and make it Part I. This contains a plate of Lord Spencer's Arms, and pages 1-52 of the text, with eight colour prints, four tinted head-pieces, six specimen sheets of his coloured inks, and two pages of types; the list of these, and also of what was intended to be included in Part II, appeared on a separate leaf, under a prefatory note by Savage, dated November 25th, 1818. Copies of this leaf—which was cancelled when the complete volume was bound—and also of Part I in its original condition, are very rare, as the division between the two parts occurred in the middle of a chapter, and there was thus no obvious break in the finished work; the writer has a separate Part I, the British Museum a separate Part II. Savage promised that this latter should appear before the end of 1818, but the work dragged on and on, until, in the Spring of 1820, he disposed of his interest in the work to "a gentleman well known in the literary world." His advent, however, did not help matters much, as another three years elapsed before the book was finished, the "Address" being dated March 25th, 1823, more than seven and a half years after the issue of the prospectus.

It is to be feared that the recipients of copies of *Practical Hints on Decorative Printing* were somewhat dubious as to having got their money's worth, as apart from the coloured plates it is a rambling work of not much interest, except from a technical point of view. The second and concluding Part contained a dozen coloured pictures, there being thus some twenty in all, half of them coloured by tints of the old dull chiaroscuro character. Most of these, however, are pure chiaroscuros, without any outline woodcut, the picture being built up from the tone blocks alone. The multi-colour prints, including the title—a rather neat piece of work—

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and Lord Spencer's Arms, of which only parts are in colour, may be reckoned as a dozen altogether, but not more than half that number are passable from an artistic standpoint. One of them is a reproduction of a two-colour initial in the Mentz Psalter of 1457, and is greatly superior in design to the ugly grotesque rendering of the same letter (B) by Branston, notwithstanding that the latter, like the title, was partly printed in gold. The volume contains eighteen samples of Savage's coloured inks, and it says much for the care bestowed on their preparation that they remain bright to this day, except the " orange lead," which has oxidised. The prints in chiaroscuro were produced by from two to nine blocks, but in only one case were the progressive stages of the picture shown, *i.e.*, in the " Crossing Sweeper and Child " (three blocks), of which there are five proofs, illustrating various stages of development. The colour prints proper were produced by impressions from two (the Heraldic title, an engraved block printed on a coloured ground) up to as many as *twenty-nine* blocks; the design made up by these last is the great feature of the book from a colour printer's point of view, though it is anything but a handsome or even pleasing picture. It illustrates Collins' " Ode to Mercy," and as it is, perhaps, the most complicated job ever printed in colours from wood blocks, it may be worth while to enumerate the tints employed, in the order in which they were used, which is as follows: four sepias, yellow, puce, blue, red, dark grey, yellow, light grey, light yellow, two reds, mauve, light blue, two blue-greys, three shades of pale pink, green, greyish-blue, light blue, a purplish red and a grey red (on different parts of the same block), blue, a pale reddish-grey, grey, and light brown, thirty in all. The original painting was by W. H. Brooke, and the colours in it were analysed, and the blocks engraved, by G. W. Bonner; nineteen was the number of the latter at first fixed upon, but others were found necessary afterwards. Savage does not give a list of the colours in this suite, " for they are so blended together, that it would answer

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Reduced facsimile in four colours of chromo-xylograph from
Savage's "Decorative Printing."
Reproduced from blocks made by the Half Tone Engraving Co., Ltd.

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no purpose." Nor is it necessary to go into similar detail here in regard to any other of the prints in Savage's book, as we are fortunately provided with an easily accessible means of tracing the progress of each picture through the press, from the first block to the last. This information will be furnished by an inspection of the remarkable copy of the work preserved in the Library of the Patent Office, bound in two huge folio volumes; it was probably Savage's own copy (though there is no note in it denoting ownership), and is printed on paper twice the size of the "large paper" series; these interesting volumes contain a proof of every stage of every picture in the book, pulled successively as the presswork progressed, but unfortunately the order of many of the leaves has been disturbed at some time or other, and they have recently been rebound without having been properly collated. Thus the series of twenty-six proofs in the "Tiger and Landscape" suite does not run consecutively, although Savage had carefully numbered each in pencil in the margin. In the "Ode to Mercy" print, however, the complete series of fifty-five proofs remains in its original order, so that the make-up of this *tour de force* can be studied in all its details; in each proof there are four point holes, one in the middle of each side, but an inch or so away from the printed surface. Each block was worked through "the run" in turn, and the sheets kept damp until they were wanted for the next block, and so on for the rest. In landscape subjects, the sky tints were usually put in first, as the composition then stood out more distinctly from the background.

In producing his book, Savage's idea was to render his "decorative" style of printing generally available, "so that all classes might enjoy such works of art as were formerly beyond their reach, and must ever have remained so as long as the painter's hand and easel were the only means of production." This sentence is quoted from a letter written at the end of 1856 to the *Daily News* by one of Savage's daughters, apropos of a puff of Baxter's colour prints which had appeared

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in that journal; she pointed out that as her father had produced prints in colours long before Baxter, the latter could not justly be called the inventor of the process. But the "inventor and patentee of oil-colour-picture printing" (as he grandiloquently signed himself) would not hear of such a suggestion, and in a long and pompous letter to the *Daily News* stated his opinion that there was no originality whatever in Savage's work, or any improvements on previous essays in the same direction; that he (G. B.) was the inventor of an entirely original process; Lord Brougham had said so, and from his Lordship's dictum there could, of course, be no appeal.

Except for the use of the metal key plate, and the mixture of oil with the colours, there was practically no difference between Baxter's process and Savage's, but the latter never attempted to make a commercial success of the method, whereas Baxter, being a persistent self-advertiser, got most of the credit for work that had really been pioneered by others.

The personal satisfaction which Savage felt at the publication of his *Decorative Printing* probably formed his only remuneration, seeing that he sunk his own profit in extra colour blocks for it. In 1825 the Society of Arts, in recognition of his work in the direction of producing imitations of coloured drawings by printing from blocks, conferred upon him a silver medal, and a cash premium of £15 15s. He wrote the Society a long letter on January 19th, descriptive of his experiences and his methods, and sent with it a few specimen colour prints, evidently proofs of some in his *Decorative Printing*. In 1832, Savage embodied the result of his experiments in the manufacture of coloured printing inks in an octavo volume entitled *Preparations in Printing Ink in various Colours*. There was not much demand for coloured inks at that time, but that Savage was not the only worker in this field is proved by the taking out of a patent the year after by one Leggett, whose printing medium was a precipitate from a decoction of logwood mixed with a solution of acetate of copper. This did not itself supply the colour, which was brought out in a

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second working by a reagent, such as a solution of tartaric acid for yellow, bicarbonate of ammonia for blue, etc. From the time when he first came to London, Savage had been engaged in collecting material for an Encyclopædia of the printing trades, and the result of his forty years of labour in this direction appeared in 1840-1, in the form of a thick octavo volume with the title of *Dictionary of the Art of Printing*. This was his last work, as he died at Kensington in 1843; notwithstanding his long connection with the Royal Institution, no memorial of him now remains there, save a copy of *Decorative Printing*, but his daughter Alice was housekeeper there for many years, and died as recently as 1903.

Savage's was not the only colour printing process with which the Institution was associated. In the Technical Library of the St. Bride Foundation is a specimen of "Rainbow Printing, executed in the Library of the Royal Institution at the Soirée on Wednesday, 17th April, 1844." This is a rococo design in octavo size, and the colouring is of the character usual to this method, running from blue to blue, viâ red, orange and green, diagonally across the plate. The inscription is in a central panel, in white on a blue ground. No name is attached, but the process is, perhaps, that of Joseph Burch, who took out several patents in connection with this class of work between 1839 and 1845.

Before dealing with the work of Baxter, a few words may be said about a process which, to some extent, constitutes a connecting link between it and Savage's. In 1819-20, Sir William Congreve (1772-1828), of rocket fame, took out several patents in connection with the preparation of engraved plates for printing the backgrounds of cheques, bank notes, etc., in colours, to prevent forgery. There were "male" and "female" dies or stamps, separately inked and combined to form a single design, that consisted chiefly of the "filigree" work (concentric circles, ovals, etc.) which to this day forms the stock patterns for similar documents; many of the plates were engraved for Congreve by Robert Branston, senior, of

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the firm of Whiting & Branston, Beaufort House, Strand, who operated the process, which they acquired from Congreve in 1830. This firm subsequently split into two, James Whiting remaining in the Strand, whilst Branston joined the elder Vizetelly. The Government used the method to a considerable extent, for the production of such things as the coloured stamps on country bank notes; the ream labels used by the Excise Department in connection with the paper duty; patent medicine labels, etc. In the hands of Messrs. Whiting & Branston, however, the process was largely devoted to what may be considered baser uses, *i.e.*, to the production of lottery bills and tickets. The public lottery is still looked upon as a legitimate form of gain on the Continent, but in this country it was abolished in 1826. For more than a century prior to that date it had, however, flourished naked and unashamed, and the sale of tickets furnished a number of firms of stockbrokers and others with a lucrative occupation; their trade announcements, which usually took the form of handbills, were, as may be imagined, worded in very seductive and persuasive terms, and—which is more to our point—were frequently printed in colours. Two or three firms seem to have made a speciality of turning out these multi-coloured lottery bills, amongst whom Whiting & Branston took a prominent place; in most instances the plates they used were engraved by the "rose-engine," and printed in colours by Congreve's process. In one case, the design would be printed in green, the lettering being in white, although in one or two places some of it would be on a black ground, or, in a central panel, on a red one, other designs being in red and blue. The lottery brokers traded under names appropriate to their calling, such as Hazard & Co., Richardson, Goodluck & Co., etc., and were apparently great believers in the "drawing" power of colour, the announcement of one firm taking the form of a nosegay, in which the flowers are printed in red and black from woodcuts, whilst one designed for Hazard represented a balloon, typifying the expanding

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fortunes of the firm's clients. This was constructed of alternate stripes of red and blue, the lettering, in white, being partly on one colour, and partly on the other. In another case (1825) a " Jack-in-the-Green " was illustrated, the black woodcut being tinted in green from a second block. Gye & Balne (the latter was the publisher of the *New Testament* in gold, to be mentioned later on), of Gracechurch Street, went in largely for the printing of these coloured lottery bills, one they got out being entitled a *New Valentine*, representing a plant in a pot, the stems and branches being printed in black, and the leaves and the pot itself in red ; the pot stood for the investor in a lottery ticket, and the plant—which bore leaves labelled with the values of some of the great prizes—for the result of the investment. In another of Gye's bills the lettering was in red and black, and illustrated by a woodcut tinted in parts with yellow. Still another printing firm in this line was Evans & Ruffy, of Budge Row ; they evidently used a good deal of oil in their colours, the bills they produced often being discoloured by it. After the abolition of public lotteries, Branston's firm used the Congreve filigree designs for a very different purpose, an example of which may be seen in the *Drawing Room Scrap Sheet*, issued in weekly parts, each of two quarto leaves, by Ackermann, in 1831. Twenty-six of these parts made up Volume I, for which a title-page was printed in gold bronze on surface-coated paper by Vizetelly & Branston. The text of the parts was printed (generally with black, though occasionally with coloured ink) on vari-coloured paper, within borders printed in colour and made up, in part, of portions of what appear to be Congreve's old " rose-engine " designs, or others re-engraved on similar lines. Many of the pages have no text, being filled with oval or rectangular spaces bordered with designs of the same filigree style, intended for the reception of printed scraps, poetical effusions, etc. ; several of the parts were got out by Whiting. In some of them are pages of music, reversed, *i.e.*, with the notes and staff-lines in white on a coloured ground. Books of this kind

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were very popular at that period, and the style was imitated to a nicety, save that the borders were of the ordinary typographical character, in the "Album Wreath" of a few years later. A fine specimen plate of Whiting's colour printing by Congreve's process (which, by the way, seems never to have been used for designs of a pictorial character), is preserved at the St. Bride Foundation, and rather recalls some of the Orloff Press productions.

Of all the workers who printed in colours from wood blocks, none have achieved so lasting a fame as George Baxter; the collection and classification of his prints have indeed been elevated into a sort of cult, thanks to the multitude of pens which have been employed on the subject, to the formation of Baxter Societies, the holding of Baxter print exhibitions, and, most recent and important of all, to the publication of Mr. Courtney Lewis's valuable monograph. Yet to those who are in the habit of studying the chromo-xylography of the middle of the nineteenth century, it is a little difficult to discover what all the pother is about. Baxter was a first-rate draughtsman, an excellent colourist, and withal a painstaking printer, but, after all, his work did not furnish the *finis coronat opus* of colour printing, even in his own day. The brilliancy and permanence of his colours always command attention to his productions, and the careful finish which is generally evident in even the most trifling details, added to a certain dignity of appearance imparted by the embossed mount, all combine to bespeak the favour of the coloured-print collector; in fact, it might almost be said that there is only one prophet in the world of colour-print collecting, and that his name is Baxter, as those who gather up and cherish other coloured pictures than those produced by his process are few and far between, save those moneyed enthusiasts who can afford to indulge in the collection of eighteenth century mezzotints and stipples in colours. The existence of Mr. Lewis's book makes it unnecessary for us to deal with the subject thereof in anything like detail, but some account of

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GEORGE BAXTER

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the Baxter process cannot well be omitted in a work like the present.

George Baxter was literally born into the printing trade, in 1804, as the son of a Lewes typographer, whose business is continued in the Sussex capital at the present day, and whose chief claim to notoriety, apart from his position as the father of the colour printer, is the fact that he was one of the co-inventors of the printers' composition roller, the other being his friend Robert Harrild, to whose family it brought fame and fortune. What Baxter did after he left school is, to a large extent, unknown ; he must, as Mr. Lewis says, have attained somewhere and somehow a knowledge of the engraver's art, but just where and how we cannot tell ; nor do we know whence he obtained the inspiration for his colour work, or even when his first print was produced. In Chatto & Jackson's work on wood engraving (1839) it is stated (p. 710) that Baxter's " first attempts in chiaroscuro engraving are to be found in a History of Sussex, printed by his father at Lewes in 1835." This refers to the plate of the " Norfolk Bridge, New Shoreham," which was contributed to the second volume of Horsfield's *History of Sussex* by the Duke of Norfolk (Lewis, 10). It is pure chiaroscuro, without any outline plate, and is printed in three shades of brownish sepia ; in the inscription at the foot Baxter said that the plate was " printed in oil colours," but it is quite different from the plates produced under his patent, and we gather from Chatto & Jackson that it preceded the colour prints. Considering the slowness with which county histories were produced in those days, it is quite likely that it was prepared a year or two before the publication of the book, and may thus easily be earlier than the colour work proper. Baxter's first dated prints (in Robert Mudie's *Feathered Tribes of the British Isles*) appeared in 1834, and are in colours, but there is evidence that he had produced at least one coloured print some time before, Lewis thinks as early as 1829, but that is doubtful. From this time forward, however, his production

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was fairly regular; from the start he made it clear that his speciality was printing in "oil colours," and this distinctive title was applied to the process all through his life, and commemorated after it—on his grave!

As soon as Baxter had decided to follow the career of a wood engraver and colour printer, he set about obtaining a patent for his process, on which point Mr. Hardie rightly observes (in *English Coloured Books*, 1906) that there was really nothing in the process to patent. Printing in colours from wood blocks had been practised for centuries before Baxter's time, and so far as the colouring by them of an impression from an engraved metal plate was concerned, this had been done by Kirkall, Pond, Le Sueur, and others; nevertheless, Baxter procured a patent in October, 1835, about which time he removed his printing establishment from King Square, Goswell Road, to the rather more aristocratic location of Charterhouse Square. Here he settled down for some years, and, following the usual practice, gathered some pupils round him, among those who were thus trained under his eye being Harrison Weir, himself a native of Lewes, and George C. Leighton, who in after years was destined to be an active rival. Baxter's process was simply the colouring of an impression from an outline or key block, which could be either a copper, zinc or steel plate, or a litho stone—though the latter was but seldom used—by successive impressions from colour blocks of wood or metal, one for each tint used. The intention was avowedly to produce "ornamental prints" in colours, "resembling a highly coloured painting, whether in oil or water-colours," instead of monochrome prints coloured by hand in the manner commonly seen in, for example, Ackermann's well-known publications; there was, in fact, no colour printing in use in England at the time when Baxter commenced his work, and for a few years he had the field to himself. Soon after he entered into occupation at Charterhouse Square, he must have commenced work on that fine book, *The Pictorial Album, or Cabinet of Paintings*, issued by Chapman & Hall

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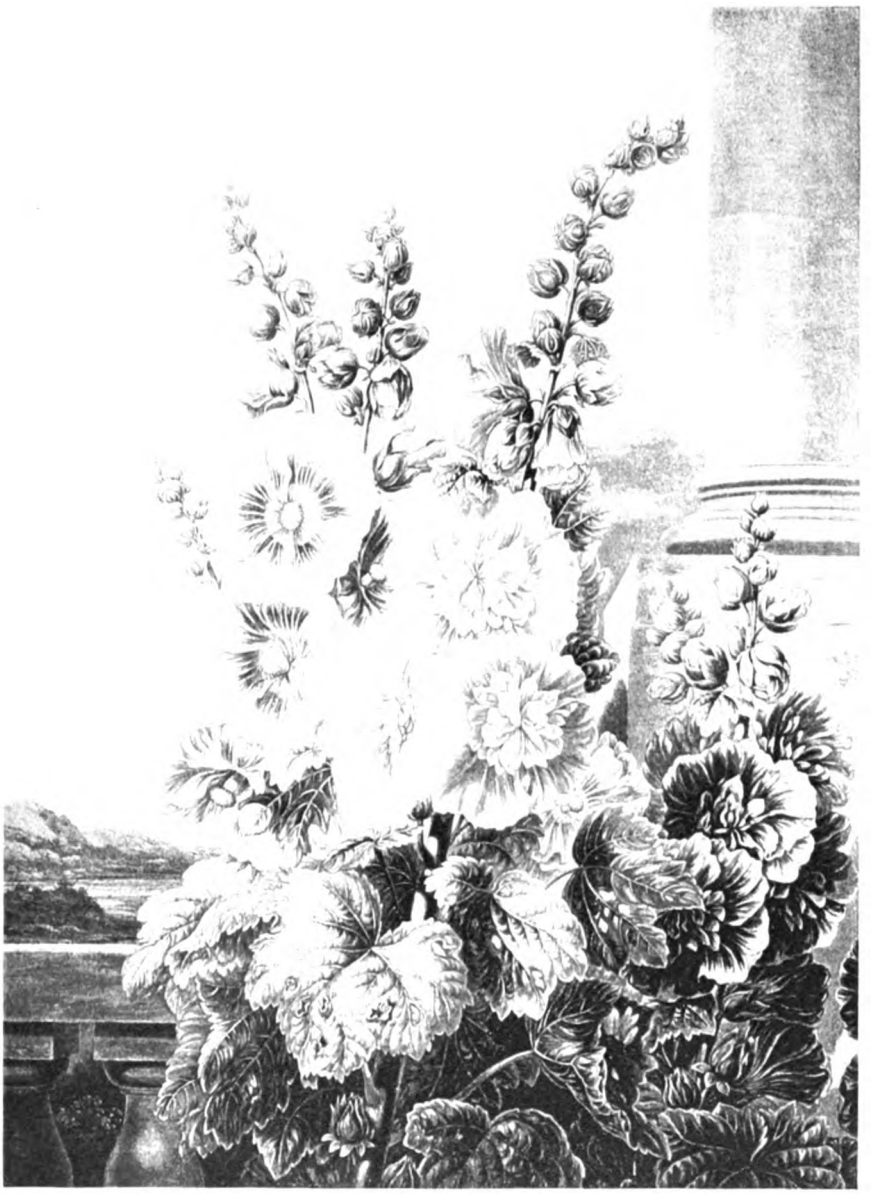

KEY PLATE OF BAXTER'S "HOLLYHOCKS"

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at the end of 1836 or beginning of 1837. It is a small quarto volume, in a handsome specially-designed binding, contains a title vignette and ten full-page plates mounted on tinted paper, and is of exceptional interest as being the first book of a popular character, illustrated by pictures printed in colours, that was published in England. Here we see Baxter at his best, the pictures being graceful in detail and delicate in colouring, rather gaining in effect than otherwise by the absence of the usual smooth glazed surface. The prints are mostly imitations of pictures by well-known artists of the time, engraved by Baxter and coloured by his process. A great many other books (Lewis mentions over a hundred) contain illustrations in colours produced by Baxter, but they were printed for publishers in the ordinary course of business, and although many of them are fine examples of his method, it may safely be said that in no case was the high-water mark of the *Pictorial Album* passed. Baxter was an artist to his finger tips, and used line engraving, aquatinting and mezzotinting with equal facility in the preparation of his key plates; the impressions from these, in very many cases, being fully finished pictures, the subsequent workings only adding colour, not detail. The key plate of "Hollyhocks," for example, one of Baxter's latest productions (1857) is a beautiful specimen of pure aquatinting, with traces of mezzotinting in one corner. All the printing seems to have been done on hand-presses of the old platen type, and, at the start at any rate, was done by boys. But careful and constant personal supervision seems to have been given by Baxter himself to every detail of the business. There was a special arrangement of points on the tympan of the press (fully described in the patent specification), for the purpose of securing accurate register of the colours. They were usually four in number—one engaging each corner of the sheet to be printed—and may occasionally be detected in untrimmed proof impressions of Baxter's prints. Small dots or other marks were also made on the key plate for the same purpose, but these were covered

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up by colour in the finished picture. The method of preparing the colour blocks was the same as that described a little further on in connection with Kronheim's work. No less than twenty-six specimen prints were sent in with the specification of Baxter's process, most of them being in colours. Many were reproduced by lithography in the printed copy of the specification, but only in black and white. The originals have no doubt been destroyed.

About 1842 Baxter made his second and final move to 11 Northampton Square, Clerkenwell, and some time after he also took in the adjoining house, No. 12. Both of these houses still exist in private occupation ; the entrance to No. 11, with the lion's head knocker that yet remains, is shown in the well-known print of the " Morning Call," published in 1853.

In view of the fact that Mr. Lewis's book contains a long and detailed catalogue of the Baxter prints, 376 in number, which that gentleman's indefatigable researches enabled him to discover, it is needless to go into any particulars of them here. The finest is generally admitted to be the so-called " Coronation " print, representing the late Queen Victoria receiving the sacrament on the occasion of her coronation at Westminster Abbey in June, 1838. This picture, published in 1842, is a veritable marvel of accuracy and fineness of detail, and is said to contain about 200 portraits of the distinguished guests invited to witness the ceremony. Like so many other of Baxter's prints, the engraved key plate is a complete picture in itself, and was, in fact, so published, the coloured impressions being issued separately, and probably in a very small edition ; this is not only the finest, but one of the largest ($21\frac{3}{4} \times 17\frac{1}{4}$ inches) of Baxter's prints, and it is also one of the rarest and consequently the most expensive, Lewis's valuation for a coloured copy being £35, and for an ordinary sepia impression, £10 to £15.

Except for the very limited competition of chromo-lithography, and the almost non-competitive existence of Knight's process, Baxter may be said to have had no rivals in his art

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until the fifties. In the meantime, his patent was on the point of expiring, and as he considered that he had not been sufficiently remunerated for the trouble and expense he had gone to in perfecting the process, he decided to petition the Privy Council for an extension. He was probably tolerably sanguine about getting it, as not only the Queen, but Prince Albert, the Queen Dowager (Adelaide), the King of Prussia, and other great personages had patronized Baxter, and expressed their admiration of his process and his pictures. He claimed to have expended £8,000 on experiments during the life of the original patent. By this time (1849) his apprentice, Leighton, had completed his term, and being perhaps well aware that a coach-and-four could be driven through Baxter's patent without much trouble, seems to have started to do it. But he first resolved to try and defeat the application for an extension, which came on for hearing in June, 1849, the ground of the opposition being that if the patent were extended, Leighton, who had devoted five out of the seven years of his apprenticeship to learning Baxter's process, would necessarily be unable to turn his knowledge of it to any practical account until 1854. But, as it was stated in evidence that some other ex-apprentices of Baxter's were earning very good wages as wood engravers, Lord Brougham, by whom the case was heard, considered that Leighton's argument was demolished by his own witnesses, so the extension was granted, and his Lordship added his commendation of the process to that of many other distinguished persons.

Hitherto, Baxter had retained his patent in his own hands, but, on the extension being granted, he evidently thought that it might be a profitable speculation to allow others to use it for a consideration, and accordingly advertised his willingness to grant licenses to work the process, for a fee of £210 in Great Britain, or £50 in France, Belgium or Germany, in which countries he had also patented his colour-printing methods, and had had his rights extended. The result was what might have been expected; not more than half a dozen

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or so English firms were willing to pay him a large sum for the privilege of operating a process which would become public property in five years' time. They included Le Blond & Co., J. Dickes, J. M. Kronheim, and Myers, in London, and Bradshaw & Blacklock, of Manchester, about each of whom a few words will be said presently. In practice, the license fee seems to have taken the form of an annual payment of £50. Baxter had a stand for his productions at the Great Exhibition of 1851, but only received Honorary Mention; at New York in 1853, and Paris in 1855, however, he was awarded medals. About this time he issued some prints in sepia tones, in the style of the portrait of the Rev. J. Williams in one of the 1837 editions of *Missionary Enterprises*, these prints being termed "Baxterotypes." In 1857 Baxter obtained provisional protection for a method of machine-ruling printing surfaces, with a view to obtaining gradations of tone in etched blocks, but he did not patent the idea. In 1859 he did patent another notion of his, viz.: that of colouring photos by his process, but is not known to have produced any pictures by this method; glass negatives, and even silver prints, it may be mentioned, were at that period often coloured by hand. In the following year, for some reason not certainly known, Baxter decided to retire from the oil-colour printing business, which seems never to have been a source of great wealth to him, if the statements he made about it from time to time are to be believed. That there was considerable foundation for them may be inferred from the fact that he had then over a hundred thousand of his prints in stock, which, together with more than a hundred sets of plates and blocks, were sold by auction, many of them, with the plant and the business itself, passing into the hands of the late Mr. Vincent Brooks, a well-known London lithographer, who arranged with Baxter that he should give a certain amount of personal supervision to the oil-colour printing branch of his establishment. Other and cheaper colour printing processes were now, however, in the field, and thus Baxter's gradually died a natural death,

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as Mr. Brooks only published a few prints of this kind during the half-dozen years that he was associated with Baxter and his process. The inventor died at his residence at Sydenham at the commencement of 1867, as the result of an accident, and was buried in the graveyard of Christ Church, Forest Hill, where a lofty red granite obelisk, erected by his widow, commemorates " the sole inventor and patentee of oil-colour printing." This remarkable instance of post-mortem advertising furnishes in some respects a keynote to Baxter's attitude towards other colour printers and printing processes. The praise that had been so lavishly bestowed on him in high quarters seems to have imbued him with the idea that he was the greatest of all colour printers, and his process the most wonderful of its kind ever invented, and this idea is reflected to-day in the writings of his disciples, who are never tired of bewailing the alleged fact that colour printing on Baxter lines is a lost art, forgetting or ignoring the certain fact that hundreds of his own and his licensees' plates and blocks are still in existence, and could be printed from to-morrow if necessary. In saying this, the writer does not overlook the personal equation, as represented by the enthusiasm and energy that the inventor displayed throughout his business career. Whilst not uniformly good, few of his own productions are equalled, and perhaps none excelled, by those of his licensees. His original designs, however, are mostly of a distinctly early Victorian character, a phase of art which is now thought little of, and it is probable that were not the magic name of Baxter attached to them, many of his prints would get little attention. But though opinions may differ greatly as to the intrinsic value of his productions, he has one undoubted claim to fame, in that he popularised and cheapened colour printing, much in the same way as his contemporary, Charles Knight, popularised and cheapened periodical literature. Baxter found colour printing practically non-existent ; he left it flourishing in many varieties, nearly all of which, save chromo-lithography, were probably inspired by his process.

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After his death, Vincent Brooks disposed of the oil-colour printing business, with the stock of plates, etc., through the inventor's son, to A. Le Blond, one of the licensees. Young Baxter kept a few blocks for himself, and was in business for a short time as an oil-colour printer at Birmingham, but the process was dead, and could not be revived, so he soon gave it up, and is supposed to have emigrated to America, whither one of the Le Blonds had preceded him. Le Blond & Co. produced prints by the Baxter process with more or less regularity from about 1850 to 1870, when they closed up this branch of their business, and stowed away the blocks and plates, together with a large stock of prints ; these remained undisturbed until 1888, when they were sold to Mr. Mockler, of Wootton-under-Edge, the founder of the Baxter cult ; his collection of prints was sold in its turn in 1896, and a large part of it was acquired by Mr. Bullock, a Birmingham bookseller, who extended the circle of Baxter's admirers by issuing a catalogue of the prints, prefaced by a short account of the colour printer's life and work. Most of the blocks and plates had been sold privately by Mockler, in 1894, to Mr. Bramah, a Sheffield ironmonger, and in his hands they still remain. There are nearly one hundred steel or copper plates, and complete suites of the colour blocks accompany most of them, so that many of the famous " Baxter colour prints " could still be reproduced from the inventor's own engraved plates.

Baxter's work, like that of many other pioneers, seems to have attracted but little attention from his own family or relations ; or from the public at large after his death. Had he not been, so to speak, rediscovered by Mockler, his name and fame would in all probability have completely passed into the limbo of forgetfulness. Even at the Caxton Quad-centenary Exhibition held in London in 1877, although colour prints of nearly all periods, and by many processes, were shown, Baxter's were not represented. Nor was there any separate collection of Baxter colour prints at the British Museum until

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Mr. F. W. Baxter, a grand-nephew of the printer, generously presented the Trustees with one a few years since. A number of books illustrated by the process, as well as some separate prints by Le Blond, can be seen at the Technical Library of the St. Bride Foundation.

Of the firms who worked Baxter's process under license, the best known is certainly Le Blond & Co., who carried on business in Budge Row and Wallbrook. The son of one of these well-known colour printers, Mr. Robert E. Le Blond, now resides in Cincinnati, U.S.A., and in a letter to the *Inland Printer* (Chicago) in February, 1909, gave an interesting account of his recollections of the process, albeit he was only a lad of fifteen when it was being carried on by his father and Abraham Le Blond. Although the patent had expired at the time of which he wrote (1854-5) precautions were yet taken to prevent strangers from seeing the process in operation. The father went to America in 1856, leaving Abraham in charge of the business, which was moved to Kingston about 1860, when several of the old hands left and went to Kronheim's; the firm had about twenty platen presses, and half a dozen litho and copperplate presses, employed in producing Baxter prints. It is curious that although Mr. R. E. Le Blond is said to have the finest collection of Baxtertype prints in America, he has never seen a genuine "Baxter"! Le Blond's best prints are the series of ovals, some thirty in number, mostly depicting English rural scenes. Many of Baxter's plates were re-used by him after the inventor's death, prior to which time, however, he had issued a good many prints on his own account, bearing his name as licensee.

Dickes, whom Lewis deservedly terms a fine colourist, had premises in Old Fish Street, Doctors' Commons; his best work by the Baxter process is *Studies from the Great Masters*, issued in nine 2s. parts, each containing two pictures, in 1859-62, by Hamilton Adams & Co. Some of the prints, such as the "Blind Beggar," after Dyckmans, which forms the frontispiece, are very good, but others are spoiled by mediocre

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drawing and rather glaring colours; Hess's " Christ Blessing Little Children " has a background of gold. These prints, like Kronheim's, were from metal plates, and there was no mention of Baxter anywhere in the volume, although as the patent had expired several years before, there was no particular reason why he should be mentioned. Even when Dickes worked the process under license, he was content to use the word " Licensee " without referring to Baxter, as in the prints he did for *Abeokuta* (Nisbet & Co., 1853) and Captain Spencer's *Turkey, Russia*, etc. (1854). On the back covers of some of the later parts of the *Studies*, a number of flattering press opinions of the work were quoted, most of them containing some general allusion to colour printing, but in no case was Baxter referred to, in the quoted passages at any rate. The burden of these opinions was to the effect that much of the colour printing of that day was both dear and bad; the *Literary Gazette*, for example, said that " Art printing in colours has long been in use, but either it has been comparatively costly in the process or weak in the results." Dickes went on producing prints of Baxtertype character down to the seventies, and some good examples of his later work of this class can be seen in a couple of volumes he illustrated for the S.P.C.K., *Scenes in the East* (1870), and *Sinai and Jerusalem;* several of the pictures in these books have an aquatint plate as a key for the colours.

After Baxter himself, J. M. Kronheim must have been the most prolific producer of Baxter prints. He was a German, who, after some experience in Paris and Edinburgh as an engraver and designer, came to London, and established himself as an art printer in Paternoster Row in 1846. His Baxter prints were produced in a manner different from that which Baxter himself used, inasmuch as the suite of blocks that imparted the colours to the steel or key plate impression were of zinc or copper instead of wood, the latter being very liable to warp. As many proofs were pulled from the key plate as there were intended to be colours in the picture, and

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each of these being off-set on a metal plate, and the extent to which colour was to be applied by that particular plate having been decided upon, the rest of the metal surface was cut away, leaving the colouring portion in relief. In those parts of the key plate which represented flesh, a stipple was generally used, otherwise line engraving was the rule, and aquatint is sometimes seen on the colour plates. The finished prints contained from eight to sixteen colours; in a typical ten-colour job there would be a yellow, two flesh tints, two blues, three reds and a brown, the lightest blue being usually printed on top of the impression from the key plate. Thirty or forty platen presses and the same number of copperplate ditto were used, and about 1,800 pulls was considered a very good day's work. The process was worked down to as recently as 1878, so that it was in operation for about thirty years, and more than 3,000 designs, separate prints as well as book illustrations, were produced by the firm during that time. Kronheims illustrated a great number of books by their improved Baxter method, for various publishers, including Cassell's *Book of Birds* (60 plates); Anne Pratt's *Flowering Plants* (Warne & Co., 320 plates); *The Pilgrim's Progress* (R. T. S., 1861); and *The Nobility of Life* (Warne & Co., 1869). This latter work was only partially illustrated by them, some of the other coloured prints it contains being produced by Edmund Evans from wood blocks, so that the comparative results of the two processes may be studied in the same volume. Two of Kronheim's prints from this book, "Duty" and "Dignity," were reproduced by the present firm of Kronheim & Co. on some calendars for 1909 which they issued, and a few sets of proofs (of which the writer has one) were pulled at the same time from the plates, and bound up, so as to show the successive stages in the production of the complete picture. One of these pictures appears in the present volume. Messrs. Kronheim & Co. still possess a large stock of the plates from which their Baxtertype prints were produced, and a very detailed account of the process, as worked by them, was given

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in a lecture delivered by their manager (Mr. F. W. Seeley) in the Spring of 1908, of which a full report appeared in the *British and Colonial Printer and Stationer* of March 12th in that year. The artistic value of their prints varies considerably, but it must be borne in mind that the products of colour printing, like those of any other commercial process, differ in quality according to the price paid for them, though this is a point often overlooked. The man who buys a sixpenny part of some popular serial, with half a dozen three-colour process prints in it, gets his sixpennyworth and no more.

Bradshaw & Blacklock followed the example of Baxter by publishing in 1853 the *Pictorial Casket of Coloured Gems*, which contained, however, about three times as many coloured prints (33 in all) as did Baxter's *Pictorial Album*, and was issued in parts, supplied to subscribers only. Among the separate prints they produced were a number of Scripture subjects, of no great merit. Of Vincent Brooks' colour printing from relief surfaces in the Baxter style, hardly anything has been recorded by the writers on Baxtertype; it may be mentioned, however, that he took over a part of Leighton's business at the time the latter left Red Lion Square for the Strand, and for a time produced prints after his manner, in which the aquatinted plate for surface printing is sometimes in evidence. Several examples may be seen in that chromographically interesting, if typographically insignificant volume *The Circling Year* (R. T. S., 1871), which is quite a specimen book of the colour printing processes of that day. Only one has Brooks' imprint, but two, if not three others are evidently his productions; the three undoubted ones are after designs by John Gilbert, and the style of the colouring suggests that they are from some of Leighton's old blocks. In any case, the general appearance is somewhat like that of Leighton's earliest *Illustrated London News* pictures.

In addition to the regular producers of colour printing, there were some others, towards the middle of the last century, who indulged in work of this character in connection with

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a few special books, or the publications of a particular writer. Prominent among these is the Chiswick Press, founded by Charles Whittingham the elder towards the end of the eighteenth century. Their work was good, but presented nothing worthy of special remark for many years, apart from the fact that a few copies of an edition of the Book of Common Prayer they got out in 1806 were printed on coloured paper, and of colour work there was practically none, unless we except a set of illustrations to Puckle's "Club." The edition in which they originally appeared was issued in 1817, when, according to Lowndes, several freaks in the way of limited editions were perpetrated, as some copies were on yellow Chinese paper, and a few on satin. Soon afterwards (1820), J. Thurston, the artist who had designed the series of little pictures for the work, had twenty-five of them republished separately, "printed in colours" on India paper, in an edition of 100 copies issued to subscribers only, the style being the one sometimes adopted at that time for lithographs, *i.e.*, the black outline was printed on a coloured ground, with the lights engraved out. It is doubtful whether either the 1817 edition of *The Club* or this volume of pictures was actually produced at the Chiswick Press. Warren, the historian of the Press, seems to know nothing of the matter, nor, it may be remarked, does—apparently—the editor of the next edition of *The Club* (1834), that was certainly got out by Whittingham, and in which the cuts of the 1817 edition were rather disparagingly alluded to. During the forties a few books illustrated in colour were got out by the Press, chiefly the publications of Henry Shaw, F.S.A., who, like Savage, preferred a good book to a good profit, spending most of the latter on expensive methods of illustration. His *Encyclopædia of Ornament* (1842), a modest forerunner of Jones' *Grammar*, might have been alternately entitled an encyclopædia of book illustration, so many and so diverse were the processes employed in the production of the plates which appear in it. Line engravings, aquatints, woodcuts, lithographs, all are there, each fulfilling a

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particular purpose in the general scheme, the title-page representing the tooling of a sixteenth century binding of the interlacing strap-work type known as "Grolieresque," from its frequent occurrence on the books which that worthy had bound for his own use and that of his friends. This was reproduced by the Whittinghams from wood blocks in five colours, red, green, black (for the outlines), blue and yellow, the actual wording of the title being in the central panel, in red, green and black. A still better—being a pictorial—example of chromo-xylography is exhibited by the reproduction of a German illustration of 1472, in black and six colours, this being a work that would do no discredit to Baxter. The volume also contains a few two-colour aquatints in various yellow and orange tones, representing old bookbindings, tile patterns, etc. In another of Shaw's works, *The Dresses and Decorations of the Middle Ages* (1843), the separate plates are aquatints of very fine grain, mostly tinted by hand, although a few, such as "The Black Prince," are partly printed in colours in very good style, but so far as colour printing is concerned the feature of the book is its fine series of woodcut initials printed in several tints, with, in many cases, elaborate marginal ornament extending the length of the page. In this branch of colour work the Chiswick Press proved itself equal to any other firm in the same line. Shaw's *Alphabets and Numerals* (Pickering, 1845), contains several pages of initial letters, reproduced from old MSS. in four colours, some of the illustrations being heightened with gold, though a few are tinted by hand. This was practically the last of Shaw's colour-illustrated books, as the expense was found to be too great to warrant their continuance, and henceforward Shaw contented himself with having illustrations printed in a sepia tint. An example of this kind of thing, though not one of Shaw's, will be found in Mrs. Bray's *Life of Thomas Stothard*, published by John Murray in 1851, the illustrations in this case being woodcuts, printed by Bradbury & Evans. In the beautiful edition of *Juvenal and Persius*, printed by the

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Chiswick Press in 1845, every page is surrounded by an ornamental frame of "combination border" character, with a rule each side, the whole being worked in red. This was the volume for which Charles Whittingham applied to the Caslon Foundry for a supply of old-style roman type, but as some delay took place in its publication, the revival of "old-style" was first made through the medium of *Lady Willoughby's Diary*. Warren, referring to the colour work of this press in *The Charles Whittinghams* (Grolier Club, 1896), describes the younger Charles, the nephew of the founder, as personally mixing and grinding his colours on a marble slab, and taking infinite pains to get them to the proper consistency and shade. "No other establishment I know of," says Warren, "ever printed in solid colour in the fashion of the plates in Shaw's books." Like most other really good work, however, the personal satisfaction which Whittingham and Shaw derived from doing it formed, it is to be feared, their only reward. Considered from the colour printer's point of view, perhaps the most remarkable of the Chiswick Press colour-printed volumes was Oliver Byrne's edition of *Euclid's Six Books of Elements*, published by Pickering in 1847. Byrne was surveyor of Crown Lands in the Falkland Islands, and a mathematician to boot; he conceived the idea of providing students of geometry with a short cut to memorising the "Elements," by issuing an edition "in which coloured diagrams and symbols are used instead of letters, for the greater ease of learners." The volume is dedicated to Earl Fitzwilliam, and its pages, with their very numerous geometrical diagrams in colour, are decidedly picturesque; four colours were used, red, blue, yellow and black, applied flat, and often all of them occur in a single diagram. Instead of "the angle A B C," etc., the author speaks of the red or the "blue angle" (or line), and talks of multiplying them by angles or lines of other colours, a decidedly original idea. For the Exhibition of 1851 the Press produced "Robin Goodfellow's Christmas Carol," printed in red, blue and black Gothic letter

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on a large folio sheet; and in the year following appeared a broadside of the same size, "The First or Grenadier Regiment of Foot Guards, its Origin and Principal Services," in old style roman letter, red, blue and black, with ornamental initials in colour, and a red decorative border surrounding the whole. This has no imprint, but is almost certainly the work of the Chiswick Press.

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CHAPTER VI

COLOUR PRINTING IN THE NINETEENTH CENTURY

CHROMO-XYLOGRAPHY. PART II

KNIGHT—LEIGHTON—VIZETELLY—EVANS—FAWCETT—SILBERMANN—THE KNÖFLERS—HODSON, ETC.

SOON as it was seen that a process of producing, at moderate cost, book illustrations and other similar prints in colours, was actually in operation and likely to prove a commercial success, several competitors entered the field that Baxter had for a few years occupied alone. The earliest of these was Charles Knight, better known as the pioneer of cheap illustrated magazine literature. He, like Baxter, was born (1791) into the trade, being the son of a Windsor printer, and it is a curious coincidence that both of them left their native towns in 1827 to try their fortunes in London. Knight, having edited his father's *Windsor and Eton Express* for fifteen years, naturally had leanings towards journalism, and his starting of the *Penny Magazine*, in 1832, proved to be one of his most successful ventures. From magazines, his next step was to books, but many of his larger publications were issued on the old lines, *i.e.*, in the form of parts published at regular intervals at a cheap rate. All his earlier works were illustrated by woodcuts, and the many thousands of these which his books and magazines required resulted in a revival of that branch of art. In June, 1838, Knight patented a

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colour-printing process, to which he gave the name of "illuminated printing," his object being the economical multiplication of coloured pictures, maps, drawings, etc., and the specification relates chiefly to the printing methods and mechanical processes he employed. At first only four colours were contemplated, and by some ingenious mechanism he contrived that they should all be applied in the course of a single passage of the sheet through the press, which was operated by hand. Knight, like Savage, had a decided preference for a press of the "Ruthven" type, in which the platen was normally at the back, but was brought over the forme by means of two springs, which "gave" to the pull, but resumed their ordinary position when the bar was released. Knight fitted the machine, in place of the usual bed, with a polygonal revolving frame or, as he called it, "prism" (attached to a rising table), each face of which, carrying a colour block, was applied in succession to the sheet as the frame revolved. In an alternative method, the frame with the blocks on it revolved on a sort of turn-table, placed on the bed of the press; whilst in a third, the tympan, with the sheet attached, was carried from block to block. It will be remembered that this idea of printing several colours at one operation of the press had been to some extent anticipated by Lalleman, at Paris, two centuries earlier. The specification also describes an apparatus in which the colour blocks were on beds, hinged to the sides of a square table, and turned backward to be inked by hand, and down again for the impression. The process was in regular operation in 1839, as the *Quarterly Review* for December in that year contains an article, headed "The Printer's Devil," in which is a description of Clowes' printing establishment, and a fairly lengthy reference to Knight's colour-printing method, which the writer of the article in question saw at work, in connection with the production of "Patent Illuminated Maps." He describes the printing apparatus as resembling a square box, each of the four sides of which carried a printing plate, for blue, yellow, red and black

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respectively, which were applied to the sheet in the order named, the last having the letterpress matter for the names of places, etc. The tints being partly blended on the paper, three more were furnished in that way, *i.e.*, the yellow and the red gave orange, the yellow and the blue green, and so on, there being thus seven colours in all.

A couple of early specimens of Knight's "Illuminated Printing" are included in Chatto & Jackson's work on wood engraving (1839), a circumstance which is accounted for by the fact that the book in question was published by Knight. Like Baxter, he was connected by marriage with a well-known printing trade firm, Messrs. Clowes & Sons, his daughter having married George Clowes, and his colour printing was done for him by them, the pictures being produced from wood blocks, coloured by plates of stereo metal. The four-colour paper covers of the volumes in "Knight's Industrial Library" were probably produced by the earliest form of his process; later on, he increased the number of colours from four to—in some cases—as many as a dozen. The best exemplification of this later method is to be found in his *Old England*, which was issued in about 100 parts during 1844-5, but Knight, being a more modest man than Baxter, contented himself with a very brief reference to his patent in an allusion to the method by which the coloured pictures were produced. Each colour was printed on top of the preceding one whilst the latter was still wet, the sheets of paper remaining stationary in the press until all the colours had been applied. These latter, by the way, were stated to be "oil colours," as were Baxter's. One wonders whether the latter ever remonstrated with Knight for thus copying the most distinctive feature of his own process. In other respects, however, Knight's method was just the opposite of Baxter's, as the latter coloured by printing from wood blocks an impression from a metal plate, whereas Knight printed his colours first from metal plates and then added an impression from a wood block.

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Old England is in two folio volumes, each of which contains a dozen coloured plates. They exhibit chiaroscuro work of a good type, though lacking the minuteness of detail and delicacy of finish which distinguish Baxter's productions; nevertheless, there is a boldness and originality about some of Knight's pictures that forms a welcome change from the rather finical elaboration of Baxter. Many of them represent architectural interiors, and as a draughtsman was employed who had an intelligent grasp of Gothic detail, the effect is often very good, though in some instances, *e.g.*, the Tomb of Mary Queen of Scots and Stratford Church Door, one wishes that the little patches of bright colour had been omitted, so as to leave the print in its original chiaroscuro state. It is necessary to point out here that these pictures are seen at their best in the first edition, the illuminated title-page of the first volume of which is dated 1844. Some twenty years after, the work was republished (with the old date on the title) by Sangster, who employed Leighton to do the coloured plates; he changed the colour scheme materially in many cases, and his reprints of Knight's pictures are mostly rather poor. For some he seems to have engraved fresh blocks, the old ones being perhaps warped or damaged. This is evident in the title-page of Volume I of Sangster's edition, which is easily known by its bright red-and-gold cover. Knight also used his process in the production of the coloured plates for *Old England's Worthies* (1847), and for some of his smaller books, but the illustrations in these are not generally so good as those in *Old England*.

For some reason unknown, the process seems to have been abandoned after only a few books had been illustrated by it, and thus we find that some other and later of Knight's serial publications, like the *Pictorial Shakespeare* and the *Pictorial History of England*, contain no colour prints, both the method and the apparatus, though excellent in theory, being probably found slow and cumbersome in practice.

Knight had, perhaps, no intention of rivalling Baxter in a

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commercial sense, but the next colour printer whom we have to notice certainly did his best to do so. This was the late George C. Leighton (1826-1895), who has already been mentioned as opposing the extension of Baxter's patent in 1849. He was at that time working with the colour-printing firm of Gregory, Collins & Reynolds, who were originally located in Hatton Garden, whence they removed to Baxter's old place in Charterhouse Square, after he had vacated it for Northampton Square. Their colour work was then of a rather mediocre character, consisting chiefly of "illuminated" title-pages and illustrations for juvenile and other cheap books. An early example may be seen on the title-page of an edition of Bishop Heber's *Palestine*, published by Clark & Co. in 1843; this is in three colours and gold, but much of the latter has turned black. The interlacing design in gold and colours on the covers is perhaps also their work, though it is in a much better style than the title. In A. Suckling's *Memorials* of some Essex churches and parishes, published by Weale in 1845, are several coloured plates by Gregory, Collins & Reynolds, though most of the illustrations in the book are black-and-tint lithographs by Standidge. The prints of Layer Marney Tower and Colchester Castle are fairly good examples for that period, and there is also an heraldic plate in colours, and one or two tinted woodcuts. The firm occasionally did colour printing on cloth for publishers, an example of which can be seen on *The New Gift Book* (*c.* 1848). Colour work on textile fabrics was not of course new in itself, though probably seldom practised by letterpress methods. The old Oriental mode was akin to that by which the Block Book prints and the later English paperhangings were coloured, but more advanced methods were practised in France during the latter part of the eighteenth century, when M. Jouy had a factory at Josas, near Versailles, in which a process of printing in colours on fabrics by impressions from successive plates was operated. In 1780, a Bavarian named Oberkampf introduced a means of printing the outlines of the picture from a deeply engraved

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copperplate, but in 1797 the plates were replaced by engraved cylinders; when the place was in its prime, 5,000 yards of colour-printed material were turned out per day, and forty hands constantly employed, but in 1843 the business was discontinued.

After Leighton joined Gregory, Collins & Reynolds, about 1847, his experience of Baxter's methods soon led to an improvement of their style. The paper-cover titles of some little books got out by Clarke & Co. in 1845, such as Jane Austen's *Pride and Prejudice* and Countess Hahnhahn's *Ulrich*, show much better work, the lettering, with accompanying floral ornament, being printed on a solid background of colour or gold. In April, 1846, they had a specimen of seven-colour printing from wood blocks inserted in the *Art Union*, the tints being flesh, red, yellow, blue, brown and neutral, followed by the black outline block, as in Knight's process. In 1847 they sent some specimen colour prints to an exhibition held at the rooms of the Society of Arts, and a year or so later, Mr. Reynolds having left the firm, Leighton took his place. A typical example of the work done under his superintendence is seen in the title-page and frontispiece to the 1849 edition of *Peter Parley's Annual*, from a design by Absolon; this is good chromo-xylography, though the plates used for the sky are apparently aquatinted, an aid to wood-block colour work which Leighton often favoured. In January, 1851, a drawing by Landseer, "The Hawking Party," reproduced in colours from wood blocks by Leighton, appeared in the *Art Journal*, much to the disgust of Baxter, although Leighton pointed out that the processes used by him and his old master were quite different. Leighton's work, like Baxter's, was shown at the Exhibition of 1851, in connection with the exhibit of the publishing firm for which he chiefly worked, Cundall & Addey of Bond Street, and early in the following year some of the colour prints shown at the Exhibition were used as illustrations to the *Village Queen*, by Thomas Miller, several of whose earlier books had been colour-illustrated by Vizetelly. These

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GEO. C. LEIGHTON

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prints are mounted on plate paper, within a gold-line border, somewhat in Baxter's style, and fairly rival some of Baxter's work.

By this time the firm had moved to Lamb's Conduit Street, and had altered their style to Leighton Brothers, George having taken his brother Blair into partnership. The latter died in 1855, a year which was destined to be an eventful one for Leighton in more ways than one, as in the early part of it a periodical called the *Coloured News*, illustrated by hand-coloured woodcuts, made its appearance; this was similar in size and style to the *Illustrated London News*, which had been started in 1842 by Herbert Ingram, who also got out a good number of books in connection with which Leighton did some work. The advent of the *Coloured News* seems to have suggested to the enterprising proprietor of the *Illustrated London News* the idea of issuing coloured pictures in that periodical, and he consulted Leighton about it. The latter was ready to undertake the work, so on December 22nd, 1855, colour printing made its debut in journalism, in the Christmas supplement to the *News*, four of the pages being occupied by coloured pictures after drawings by John Gilbert, but they did not constitute a great artistic effort. The designs were engraved as woodcuts in the ordinary way, and the impressions from them coloured by etched tone blocks; both blocks and colouring are extremely crude, but the idea caught on with the public, and Leighton could not produce the plates fast enough to satisfy the demand. Hearing this, Ingram, in his usual energetic way, rushed off in a cab to Leighton's place in Red Lion Square, and insisted on taking back with him a number of plates, on which only one or two of the colours had then been printed; Leighton demurred, but Ingram was insistent, and had his way. The next batch of coloured pictures was published in the *News* for May 10th, 1856, when the public were informed that they were produced by means of "chemical solutions"; what this meant it would be difficult to say now, unless Ingram (who did not mention Leighton's name in connection with

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the work, although, as his imprint was on the pictures, it was unnecessary) wished to convey that the tone plates were etched by a modification of the aquatint method, adapted to surface printing. From this time onward the process was gradually improved, the coloured supplements appearing regularly in the *News* down to the eighties, when chromo-lithographs took their place. Some of the prints published in the sixties were fine examples of colour work. From 1857 to 1885 Leighton also did the coloured paper covers and plates for Ingram's *Illustrated London Almanack*, which are fairly representative examples of the cheaper class of his work.

In August, 1858, Leighton was appointed printer and publisher of the *Illustrated London News*, and from 1860 consequent on the accidental death of Ingram, he had almost complete control of the paper during the surviving sons' minority. His brother Stephen, the other partner in the firm of Leighton Brothers, looked after the general colour printing business of that concern at Milford House, Strand, and under his active superintendence much good work was turned out, although, like that of Kronheim and other printers in colours on an extensive scale, it varied in quality according to circumstances.

An interesting example is seen in Barnard's *Landscape and Water Colour Painting* (1858), in which many of the plates represent the various colour stages necessary in the production of a water-colour drawing. A rather unpleasant feature of some of Leighton's coloured pictures is the strong hard outline of the woodcut or black block, as seen in Ward & Lock's *Fields and Woodlands* and *Pictorial Beauties of Nature* (1873), as well as in E. V. Boyle's *Beauty and the Beast* (1875). Much better work occurs in some of the plates for *Gems of English Art of this Century* (Routledge, 1869), which contains twenty-four full-page illustrations reproduced from pictures in the national collection; all these were printed in oil colours from wood blocks, and several of them are really excellent

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productions, that would probably be "collected" if they bore Baxter's name instead of Leighton's. Some, however, like "Il Duetto" or "The Fisherman's Home," might have been omitted without loss to the book. Judging from the point marks at the side of the print, Constable's "Valley Farm" required twelve blocks for its reproduction.

Some time in the sixties, the firm published a folio volume of *Specimens of Colour Printing*, containing twenty-seven plates, some having several subjects on them. This is a rare book, and is of importance as furnishing examples of practically every phase of Leighton Brothers' colour work, from reproductions of pictures in the highest style of their art, down to purely commercial subjects like tile patterns. There are two or three prints after pictures by Birket Foster, whose work was more commonly reproduced in colour by Evans, and several of birds and animals after Harrison Weir, whose *Alphabet of Animals* (1857) was illustrated by twenty-four coloured plates of this character.

Leighton vacated his post of printer-publisher of the *Illustrated London News* in 1884, and two or three years afterwards closed up his firm's colour printing business, then located in Drury Lane. He had married a niece of Faraday, the famous philosopher, and died at Highgate in 1895.

Round about the middle of the nineteenth century, the wood block processes were more popular than any others used for the production of coloured book illustrations, so that the Leighton firm had quite a number of rivals in this respect, only a few of which, however, need be mentioned here, and of these we will deal first with Henry Vizetelly (born 1820), the son of a London publisher, James Vizetelly, who came to grief in 1840. Henry was apprenticed to a wood engraver, and after having served his time, started business with his brothers as engravers and printers in one of the purlieus of Fleet Street, subsequently removing into that thoroughfare. At the time his father's firm collapsed, it was engaged in the production of an elaborately decorated edition of Lockhart's

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Ancient Spanish Ballads, for John Murray; Owen Jones, the pioneer of chromo-lithography in England, was responsible for all the ornamental designs in the volume, and being fresh from his great work on the Alhambra, then in process of publication, was in a position to prepare something of a character appropriate to the book. Much of the colour decoration is, indeed, reminiscent of that of the Alhambra, particularly the numerous separate titles, which were lithographed in gold and colours by Jones himself; nearly all the rest of the work was got out by the Vizetellys, and so far as the colour printing part of it is concerned, consists of ornamental borders, initials, and head and tail-pieces, mostly printed in a single tint, though occasionally in two, red and blue or blue and yellow. It is a fine example of letterpress colour work, even the end papers being printed in gold and colours, and the list of contents in red and blue, whilst the publisher's list of books at the end of the volume is in a puce tint, within borders. There are a few separate plates, woodcuts printed in black on a lemon-coloured ground, pictorial letterpress work in colours being as yet almost a monopoly of Baxter's establishment. In 1856, Murray republished the work, Owen Jones supplying the decorations as before, but on this occasion the printers were Bradbury & Evans, who produced a volume in every respect worthy to be placed with the previous one. The greater part of the ornamental detail was new, including a beautiful series of titles in red and blue; the chromo-lithographed titles were not so frequent, and the Alhambra *motif* was replaced by another of a different type. The general style and formation of each edition were the same, and in an uncut state, in their original gold-stamped bindings, these two volumes are amongst the finest of their kind.

The *Ballads* was followed in 1845 by an edition of the *Book of Common Prayer* on somewhat similar lines, this also being published by Murray, and decorated with initials, borders, etc., by Jones, all of which were specially designed for the volume; the initials were in two colours throughout, red

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and black or red and blue. Much of the beautiful marginal ornament, as well as some of the borders, was likewise in two colours, and occasionally—as in the opening pages of the Order for Morning Prayer—in three, red and blue stem and leaf ornament on a black background, sprinkled with white dots. In these cases the entire design was first printed in black, and the colours added on top, the several separate titles being chromo-lithographed by Jones, as in the *Ballads*, but the full-page woodcuts were within broad borders, printed on a yellowish ground. The most elaborate section of the book is the Communion Office, which has a fine series of two-colour initials of Gothic character, in three sizes, and two-colour marginal ornament to every page; the entire volume is rubricated. It was issued again in 1850, in the same style, and the illustrations and some of the two-colour initials appeared in a still later edition, from which, however, nearly all the fine colour work is absent.

Vizetelly did not do very much in the way of pictorial colour printing. For Mrs. Sinnett's *Story About a Christmas in the Seventeenth Century* (1846) he printed the frontispiece in black on a yellow ground, which was afterwards coloured by hand, and in *Wonderful Stories for Children*, published in the same year by Chapman & Hall, are a few woodcut illustrations printed in colours, poor in style and bad in register, but in *Christmas with the Poets* (Bogue, 1851) he went a step further, and probably furnished Edmund Evans with the idea for his first essays in engraving for colour work. This volume has fifty small illustrations after Birket Foster, printed in black, with a tone (grey or light brown) applied from a second block with the lights engraved out, though a third was used in some cases. There was a number of large ornamental initials in black and gold, so that some of the pages required four workings, against the three of the *Ballads* or the *Prayer Book*. The Great Exhibition being held in the year in which it was published, this book was selected by the Trustees of the British Museum as a representative example of contemporary British printing

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and engraving, and as such was shown to many of the distinguished foreigners who were in London at that time.

As a colour engraver of pictorial subjects for popular books, Vizetelly, though not a prolific worker in that line, preceded Evans by some years, and excellent examples of this branch of his work will be found in the frontispieces and floral titles he produced in four tints for Thomas Miller's *Boys' Spring Book*, and the three companion volumes that made up the cycle of the seasons (Chapman & Hall, 1847). These charming little volumes provide, in their way, as good specimens of colour work as did Mudie's four volumes of *Elements*, illustrated in similar style by Baxter eleven years before. An entirely different class of work appears in Noel Humphrey's illuminated edition of *The Book of Ruth*, published by Longmans in 1850; indeed, were it not for the presence of Vizetelly's imprint at the foot of the last page, one would be inclined to attribute this dainty little volume to Owen Jones, so exactly does its style resemble that of the chromo-lithographed volumes he did for the same publishing firm at this period; the lettering of the title is in gold, that of the text is in black letter, with rustic initials, and floral borders in colours on a gold ground.

In the year following, Humphreys published his *Sentiments and Similes of Shakespeare*, as "an example of book decoration" (he tells us in the Preface), embodying "the latest refinements in decorative printing," the Shakespearean selections being "enshrined, as it were, in a reliquary as rich as a combination of the typographic and litho-chromic arts could form." It says much for the credit of Vizetelly's press that a work of such special merit was entrusted to him by its author, and whatever may be thought of the work by the present-day printer, there can be but little doubt that Humphreys' critical eye was pleased and satisfied. The style adopted is quite unusual, each page being divided up by four plain gold rules, crossing and running to the edges of the leaf, so as to leave a rectangular space in the centre for the text. The lines commence with capitals on a gold ground; there is a

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gold rule between every two lines, and as the lines of course vary in length, each is filled out with an ornament in gold. With the running and chapter headings in gold capitals, and the large decorative initials at the head of each section in gold on a black ground, this volume is a fine piece of artistic typography, that could not easily be matched. The lettering of the title is in red, black and gold, but the principal artistic feature of the book is the first page of the text, beautifully printed in chromo-lithography, before the text was adjusted to it. It is a very fine piece of colour printing, and fully merits Humphreys' eulogium of it. "Recent progress in various kinds of printing," said he, "has enabled the press to rival the art of the illuminator himself, and the highly enriched bordering round the first page of this book is entirely the result of this new application of art. The whole labour of the decoration has, after the manner of the later and more eminent illuminators, been directed to the first page, instead of being spread over the whole volume in multiplied ornaments of an inferior quality, an unlimited number of separate printings having been employed, with the desire to make it one of the most perfect works of an artistic character ever produced by mere mechanical means." The decoration of this border is of a character quite appropriate to the Elizabethan age, and includes a portrait of Shakespeare, tragic and comic masks, an historiated initial with a scene from Macbeth, and a great amount of minute detail, all printed in gold and colours. The beauty of this page probably led to its abstraction from many copies, including that at the British Museum. This remarkable volume is in an equally remarkable binding, the covers being moulded in papier mâché in imitation of carved ebony, the design being of a sixteenth century Renaissance character, in high relief, and pierced to show a gold background, in the central panel of the upper cover being a bust portrait of Shakespeare, in material of a terra-cotta tint, and in a similar panel on the lower cover is his monogram, encircled by a wreath.

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Another interesting example of colour work by Vizetelly is an octavo edition of Dean Milman's *Horace*, published by Murray in 1849. The "Life" and preliminary portion of the volume has each page surrounded with a border of classical design by Owen Jones, printed in a single tint, and to each book of the text there is a fine title-page printed in colours, two of these having lettering and floral ornament in red, yellow and green, on a black background, and surrounded with a border printed in brown. Others have floral borders in colours, with the white of the paper for a background, two or three more having coloured lettering on a yellow ground, or floral designs in colours on a black ground; altogether this volume is a fine and unusual example of letterpress printing in colours.

Edmund Evans comes next, and is perhaps the best known of all the wood engravers for colour work, except Baxter. Born in Southwark in February, 1826, he was first put to work in a printing office, but when his artistic inclinations displayed themselves he, after only six months' tenure of the post of reading boy, was apprenticed to Landells, the wood engraver. When his time was up, in May, 1847, he commenced business in that line on his own account, ultimately settling, in 1851, at Racquet Court, Fleet Street, where he secured his first order for colour work from Messrs. Ingram, Cooke & Co., publishers of the National Illustrated Library of popular books. It was for one of the volumes in that series, Ida Pfeiffer's *Travels in the Holy Land*, published in 1852, with eight tinted illustrations from drawings by Birket Foster. It was decided that these should be engraved for three printings, the key or outline block in dark brown, the second in a buff tint, and the third in a greyish blue. In all these pictures the sky is very dark and heavy, and is relieved by straggling little patches of white cloud, giving the effect of a flock of white birds on the wing, but this peculiar mannerism was abandoned (except in one case) in the next volume of the series, *i.e.*, the same author's *Voyage Round the World*, also issued in 1852.

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The illustrations in the two volumes of Duncan's *History of Russia* (1854) are of similar character, but in some books by Miss G. P. Willis ("Fanny Fern"), published about the same time, there were only two blocks, the outlines, in dark brown, being tinted with a lighter variety of the same colour.

It cannot be said that these early pictures are of a very attractive character, though it must be remembered that the books were low priced. A better and more finished style of colour work is seen in *Sabbath Bells, Chimed by the Poets* (Bell & Daldy, 1856), a series of poetical extracts, accompanied by illustrations by Birket Foster, which were engraved by Evans for working in three or four colours. These pictures are on the text pages, and vignetted. Both the old and the new styles of colour work will be found in this volume, as the handsome woodcut initials which begin each piece of poetry are coloured by hand, although in the *Psalms of David* (Sampson Low & Co., 1862), there is a fine series of woodcut initials printed in red and blue by Evans. *Sabbath Bells* is of further interest owing to the fact that as the textual portion was printed at the Chiswick Press, the sheets had to be conveyed from the one establishment to the other in order to be completed, though all the processes were of the letterpress order; the work has been several times reprinted. Perhaps the best of all the books of this kind that Evans produced was Willmott's edition of Goldsmith's *Poems*, published by Routledge at the end of 1858, which contained forty-one illustrations in colours, engraved and printed by Evans after drawings by Birket Foster. These pictures were of a more elaborate character than those in the *Bells*, and great care was bestowed on their production. They are tinted woodcuts, and were worked on an ordinary hand-press; this handsome volume has also a number of head and tail-pieces designed by Noel Humphreys, many of which are printed in black and white against a tinted background, the whole of the printing work, illustrations and text, being done at Evans's establishment, and every page framed in a double gold-line border.

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Hitherto, we have been considering book illustrations of a more or less ordinary character, but in the *Art Album* (Kent & Co., 1861) we come to a work in which the pictures are the primary feature, the text consisting of little more than brief poetical effusions, descriptive of the subjects of the prints. There were sixteen of these latter, all separate plates, engraved and printed in a number of colours by Evans, in the style of the Baxter prints, which were then beginning to wane in their popularity. This is perhaps Evans's best art work in colours, and a few of the pictures, such as T. S. Cooper's " Winter," a study of sheep in that artist's well-known style ; John Gilbert's " Marriage of Griselda," and a fruit study after W. Hunt, are really good, but others are rather mediocre, some of them, like " The Baron's Chapel," being little better than tinted woodcuts. Here and there, as in the blue plate for " Lucy," aquatinting was used to produce a block for surface printing. Another good colour book of Evans's is *Choice Pictures and Choice Poems* (Ward, Lock & Co., 1867), though the twenty-three coloured pictures in this are mostly of the tinted woodcut type, and printed on the text pages ; many of them were subsequently used again in batches for some smaller books. The letterpress portion of this particular volume, it may be mentioned, was printed in brown ink, also by Evans.

A distinctly novel class of work occurs in Dulcken's *Bible Album* (Ward & Lock, 1863). Here there are fifty-six woodcuts, many of them full page, printed in tints by Evans ; the original outline cuts are evidently of earlier German origin, and some of them are split or otherwise damaged. Evans seems to have been entrusted with the task of preparing tone blocks to accompany them, partly, perhaps, to hide defects, and partly to give a novel aspect to the work ; only a single tone block is used for each picture, the tints being mostly grey, sepia, or a light reddish-brown. Evans engraved his blocks somewhat in the chiaroscuro manner, so that in many cases the style of the old German masters of that art was in some degree recalled. The volume, which was entirely Evans's production, is

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LEARNING TO GO ALONE

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interesting as an unusual and little-known example of his work.

In *The Nobility of Life* (Warne, 1869), an opportunity is afforded of comparing the relative effects of the wood-block colour work of Evans and the Baxtertype process used by Kronheim & Co. The volume contains twenty-four full-page plates, mounted on thick toned paper within gold-line borders, the lettering being also in gold. Each of the two firms concerned printed a dozen of these plates, but it must be admitted that Evans does not show up here at his best, Kronheim's pictures, although the register is not always faultless, being almost uniformly excellent, whereas Evans's, which seem to have been printed in oil colours to match the others, are often rather poor by comparison, considered as colour prints. Mr. Evans's best colour illustrated book, from his own point of view, was Doyle's *Chronicle of England* (Longmans, 1864), in which there were eighty illustrations printed on the text pages; many of them, however, are rather stiff and formal, due in large part to the nature of the subjects, which could hardly be adapted to picturesque or artistic treatment. But this is a fine book, though, curiously enough, it has never been reprinted, notwithstanding that the edition was soon sold out. Many of the pictures necessitated eight or ten printings, and it is recorded that this was the last important colour job done by Evans on a hand-press.

In addition to his work as an engraver and printer of book illustrations, Evans also built up a reputation as a producer of coloured book covers, for pasting on the boards. This branch dates from 1853, when Mayhew's amusing story of juvenile flirtation, *Letters Left at the Pastrycook's*, was published; the cover of this has a two-colour design in dark blue and bright red; other similar covers were prepared for *The Log of the Water Lily*, and for an edition of *The Lamplighter*, published by Warne & Routledge. These early covers were mostly printed on white paper, but as this soiled very quickly, a yellow-coated make was substituted for it, which gave rise

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to the term "yellow-backed," as applied to the "Railway" and other series of cheap popular novels. Three-colour covers —printed, of course, from wood blocks—were frequently prepared for the English editions of works by Mark Twain and other American authors, the outline block being worked in dark brown or black, and the flesh tints engraved on the red tone block, which was printed first, followed by another tone block in blue or green.

Mr. Evans's name will always be associated with the production of cheap colour-illustrated children's books, of which his firm have printed enormous numbers during nearly half-a-century. There was a sixpenny series issued by Routledge in the sixties, in which the pictures were in three or four colours, and a shilling series in 1874, when five colours were used, and in this connection it may be mentioned that that charming little book, *Baby's Opera*, illustrated by Walter Crane, was published by Evans on his own account, and was so successful that an amplified edition of it was produced, under the title of *Baby's Bouquet*, followed in 1887 by *Baby's Own Æsop*. In this last, photo-mechanical process blocks were used for the outlines, though the colours were applied from wood in the old way. The very numerous children's books, so quaintly and daintily illustrated in colour by Kate Greenaway (a specimen picture from one of them appears in this volume), were also turned out from the "Racquet Court Press," as Mr. Evans termed his printing establishment, from its location in that Fleet Street alley. These are so well known that it is not necessary to do more than mention them and the charming series of little almanacs associated with the name of this favourite artist, which are getting to be included amongst "collected" items. The late Randolph Caldecott was another popular illustrator of children's books whose designs were reproduced by Evans in colours.

After forty years of work as an engraver and printer, Mr. Evans retired in 1892, since which date his sons, Edmund Wilfred and Herbert Evans, have continued the business,

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which has been transferred from its old City home to Swan Street, in the Borough. Edmund Evans died in 1906, but it is interesting to be able to record that the art of colour printing from wood blocks, of which he was one of the pioneers nearly sixty years ago, is still continued by his sons, who yet find customers for this class of work, notwithstanding the oft-repeated tale that wood engraving is dead. Mr. H. Farnham Burke's magnificent *Historical Record of the Coronation* (1904) contains several fine plates in which an impression from a half-tone key block in black was coloured from several wood blocks, excellent register being maintained, though there is a great deal of intricate detail in costumes, etc. More recently (October, 1908, to February, 1909), Messrs. Edmund Evans, Ltd., reproduced for the *Studio* half a dozen Japanese colour prints, in which the colouring was applied entirely from wood, and an interesting chromo-xylograph of a different character was produced at the same time for the firm's own Almanac, from a design by Mr. Graham Robertson.

The English colour printers dealt with up to the present all worked in London, where they had the advantage of seeing and knowing what had been or was being done in that line by their predecessors or contemporaries. We now, however, come to a man who carried on his work in a little country town, in a remote part of Yorkshire, and seems to have been absolutely self-taught, Benjamin Fawcett to wit. Born at Bridlington, in 1808, he was apprenticed to a printer in that town, and occupied himself in his leisure hours by practising drawing and engraving, arts for which he had a natural bent. In 1830 he started business as a printer, bookbinder and bookseller at the adjacent town of Driffield. Here, some years later, he began to get out a series of pictorial copy book covers, the designs on which were drawn and engraved by himself, and subsequently some drawing copy books and illustrated children's books, for a Leeds publishing firm.

The turning-point in his career dates from the time (in the late forties) when he met the Rev. F. Orpen Morris, Vicar of

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Nafferton, a village near Driffield, who was not only a zealous Churchman, but an indefatigable naturalist. The friendship between them gradually led to a business connection being formed, which lasted down to the time when it was severed by Morris's death in 1892. Which of the twain first suggested the publication of a series of works on British natural history we cannot say, but it is certain that Morris undertook to write, and Fawcett to illustrate and publish, a *History of British Birds*, which commenced to appear in shilling parts in the Spring of 1850. The 360 woodcuts it contained were printed on a lemon-tinted ground and coloured by hand. About this time Fawcett moved to new premises in Driffield, giving up his retail book-selling and stationery business in order to devote himself to printing and publishing. "It was here," according to the *Memoir* of Morris, "that he brought to perfection a new process, invented by himself, for fine printing in colours, for which his establishment soon became famous in the trade."

The earliest contemporary public reference to this is probably that which appeared in Part I of the *Birds*, announcing the forthcoming publication of a companion work by Morris, on the *Natural History of the Nests and Eggs of British Birds*, the illustrations in which were to be "executed in an entirely new manner." The *Nests* was issued, like the *Birds*, in parts, which commenced to appear about January, 1852. The complete work (as well as the previous one, and many others of Fawcett's) was published by the London firm of Groombridge & Sons, and contained seventy-eight full-page plates. As in the *Birds*, there was a solid background, in this case of a grey tint, on which the eggs and nests were represented in their natural size and colour, there being generally a brown and a black block used to give the markings characteristic of the eggs of the different species; here and there a little hand-touching is in evidence. The work was dedicated to a local magnate, the Earl of Carlisle, whose patronage, together with that of many other noblemen and gentlemen, was secured by the Rev. F. O. Morris, who was Chaplain to the Duke

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BENJAMIN FAWCETT

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of Cleveland. The dedicatory address referred to "these volumes, in which a new invention has been applied in the department of Art under which they are illustrated." Nevertheless, the result was apparently considered rather unsatisfactory, as in the next work Morris prepared for Fawcett, on *British Butterflies* (1853), most of the colouring was applied by hand, although on some plates there was two-colour work; and in a still later publication, on *British Moths* (1859), the illustrations were hand-coloured lithographs. Whatever the reason for this may have been, it was certainly not the inability of Fawcett to engrave for first-class colour work, as the publication of the *Moths* was contemporary with the preparation of a beautiful volume of a popular character, illustrated in colours from wood blocks, viz.: *Gems from the Poets* (Groombridge, 1860). It contained, besides the illuminated half-title, twenty-four full-page plates, fine examples of pure chromo-xylography, which were engraved by Fawcett after drawings by F. A. Lydon, a Driffield youth who served his apprenticeship with Fawcett, and remained with him until 1883, when he removed to London, where one of his sons still carries on the business of a designer and engraver for colour work, and another son is an etcher of process colour blocks, both having helped their father in his work for Fawcett. Brilliant sky effects are a feature of the landscapes Fawcett printed in colours from Lydon's designs, though the tints in some of the pictures are rather "dry" and flat; hand-presses were used, and the inks were prepared on the premises from dry colours. Fawcett having an enormous capacity for work, superintended every department of the business personally, in fact his work was his only hobby, and the Morris *Memoir* describes him as somewhat of a recluse in other respects, so much so that many residents in Driffield never even set eyes on him. His greatest illustrated work was Morris's *County Seats of Great Britain and Ireland*, started in half-crown parts by Longmans, in 1864. Each volume contains forty coloured plates, mostly produced in eight tints, and the first two volumes were issued by Bell

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& Daldy, who succeeded Longmans. Mackenzie, another London publisher, had charge of the other four, the work being finally issued, until its completion in 1880, to subscribers only, of whom there were about ten thousand. The six volumes were published at nine guineas, and there was an additional volume of facsimile autographs of subscribers, a curious idea. Although the receipts from the work were in the neighbourhood of £100,000, it was not a commercial success. These volumes contain much good colour printing, though some of the pictures are a little hard in appearance, and it is said that about 2,000 separate blocks were engraved for them. Among other books for which Fawcett produced coloured plates may be mentioned Hilberd's *Rustic Adornments* (1867), with illustrations which remind one somewhat of those in Baxter's *Cabinet of Paintings*, they being surrounded by a broad plain border in the greyish tint often seen in Fawcett's books; Lowe's *Beautiful Leaved Plants* (1861), with sixty coloured plates; Houghton's *British Fresh-Water Fishes*, with forty-eight fine plates (one of Fawcett's best natural history books); and Couch's *History of the Fishes of the British Islands*, with 256 plates. From a pictorial point of view, one of the handsomest colour-illustrated works issued from the Driffield press was Ross's *Ruined Abbeys of Britain* (Mackenzie, 1882), which is in two folio volumes, each containing six really fine plates, which may rank amongst the best work of the kind. Soon after its publication, Fawcett's health began to fail, and later on he was compelled to leave the business in the charge of his sons, who do not seem to have inherited all their father's energy and talent; the trade gradually fell off, and some financial losses precipitated a crash in 1894, when the business came to an end. Fawcett had died at the commencement of the previous year, and was thus spared the pain of seeing his plant come to the hammer, as it did in January, 1895. Though personally almost unknown outside the little town in which he lived for sixty years, he was a remarkable man in many ways, and the day may yet come when the beautiful colour prints he

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produced will be appreciated and sought after. His forty years' collaboration with the Rev. F. O. Morris resulted in the production of a long series of important and valuable works, particularly in the department of natural history, and many of them still hold their places as standard authorities on the subjects with which they deal. Fawcett's publications obtained honours at many local and international exhibitions, including medals in 1866-7 and 1881-2.

Although a great deal has been said in this chapter about English colour printing from wood blocks, it must not be assumed that work of this character was not being done in other countries, during the first half of the nineteenth century. In France, the Royal Printing Office at Paris made some experiments in this direction as early as the twenties, and a very good example of the results attained may be seen in the *Album Typographique* prepared in 1830 in honour of the visit of the King and Queen of Naples to the establishment, during their stay in Paris. This is a folio volume, produced under the superintendence of the Technical Director of the Office, M. Duverge, and contains, among other matter, some medallion portraits of their Majesties, surrounded with elaborate ornamental borders printed from wood blocks in gold and colours, though not more than two of the latter seem to have been used.

Ten years later, an *Album Typographique* was produced at Strasburg by Gustav Silbermann (born 1801), a printer who, to some extent, worked on the same lines as Baxter, with whom he was, of course, contemporary. The Album was issued to commemorate the alleged fourth centenary of the invention of typography by Gutenberg, and has a title-page printed in four colours, red, green, blue and gold, the text being in brown. It is letterpress work, into the composition of which " combination " borders largely enter. Silbermann was an exhibitor at the London Exhibition of 1851, where his art was described as " a new process " ; amongst the specimens of his work shown on that occasion were some

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reproductions in colours from wood blocks of the stained-glass windows of Strasburg Cathedral, engraved to scale. There was also a lithographed map, tinted by letterpress printing, and some illustrations of soldiers, printed in oil colours and mounted on cardboard to serve as children's toys. Many hundreds of thousands of these were turned out by Silbermann. In 1872, after a career of forty years as a printer, he decided to retire from business, and in order to mark the occasion issued an *Album d'Impressions Typographiques en Couleur*, containing fifty-two plates. The title from the former Album was re-used, and there were many other fine colour plates in addition, including a chromatic scale constructed by M. Chevreul, comprising seventy-three shades, and some reproductions of decorations from illuminated MSS. Most of the prints, however, were in only two or three tints, though Silbermann's chief object in the publication of the volume was to show other typographers the possibilities of letterpress printing in colours, his own efforts in that direction having been so well appreciated that they gained for him eleven prize medals at various exhibitions. He died at Paris in 1876.

The most noteworthy living exponents of chromo-xylography on the Continent are undoubtedly the Brothers Knöfler, of Vienna, who, for more than a quarter of a century, have been producing the beautiful colour prints which may be seen in the windows of many London art dealers. Their father, Heinrich Knöfler (1824-1886), pioneered this class of work in Austria. He was the son of a carpenter at Schmolln, in Saxe-Altenberg, but though originally put to follow the same trade, was destined to do something better with wood than merely shape it with saw and plane. His artistic tendencies soon manifested themselves, and after a few lessons in oil painting from a Dresden artist, he started on the usual pilgrimage of the young German workman, in the course of which, during a stay at Meissen, he found means of obtaining some instruction in water-colour. Still working as a carpenter, he

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EXAMPLE OF

EARLY ITALIAN WOOD-ENGRAVING

Adopted to Old Style Printing
Printed by George Falkner & Sons, 170 Deansgate
Manchester

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moved on to Hanover, and by 1850 was in Vienna, henceforth his home, where his opportunity at last came to him. One day in the dinner hour he was engaged in drawing the portrait of a fellow workman, and was seen by Professor Ritter von Perger, who, struck with the quality of his work, advised him to take up art as a career, and moreover promised to help him to do so, which advice young Knöfler did not hesitate to follow, and accordingly started work as a portrait-painter, to the great disgust of his father, who refused to have anything more to do with him. Subsequently, Professor Perger advised him to try his hand at wood engraving, an art which was at that time undergoing a revival in Austria. This he did, and for a few years worked for his friend and patron the Professor, for the Austrian State Printing Office, and, from 1856, for the firm of Dittmarsch & Zamarski. In that year he produced his first attempts at colour printing from wood blocks, and soon began to make his mark in this branch, so that not long afterwards he started business for himself, with the help of a small hand-press which he borrowed—power machines have never been used in the production of the Knöfler colour prints. One of his earliest works on his own account was the series of illustrations to an edition of Professor Fuhrich's *Spiritual Rose*, depicting the sufferings of Christ. It is indeed as a producer of religious prints that the elder Knöfler is perhaps best known, and one of his most frequent customers was the Ratisbon ecclesiastical publisher, Pustet. Perhaps his finest print is that of the " Madonna and Child," though one representing a window in the Votive Church at Vienna runs it very close as a matter of artistic execution.

For a splendid folio edition of the Roman Missal, published by Reuss at Vienna in 1861, Knöfler engraved and printed a frontispiece in gold and twelve colours, consisting of a number of scriptural subjects in oval or circular panels, with a border of slight leaf ornament in the style of the mediæval MSS. There was also another fine chromo-xylograph facing the Canon of the Mass, the Missal itself being a good specimen of letterpress

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colour printing in red and black, with a series of two-colour initials, the lettering of the title being in red, blue and gold. The frontispiece was considered of sufficient interest and importance to be illustrated seventeen years later, in all its stages of production, in H. von Weissenbach's *Der Xylographische Farbendruck*, issued at Nuremberg in 1878, in a very limited edition. A copy of this may be seen in the Technical Library of the St. Bride Foundation, but for some reason or other Knöfler's name was not mentioned, and his imprint was even cut off the blocks, which were printed by Ludwig Lott, of Vienna. Another fine example of Knöfler's colour work was the series of twelve illustrations to F. von Seeburg's *Der Aegyptische Joseph*, published by F. Pustet at Ratisbon in 1878, which are excellent specimens of chromo-xylography, engraved from pictures specially painted by C. Madjera and E. Pessler.

Heinrich, the elder of the two brothers who now carry on the business (born in 1859), commenced his training as a woodcut engraver for colour work in his father's establishment in 1873, and two years later was joined by his brother Rudolf (born 1861). They underwent a long period of probation, although their father's increasing infirmities soon caused them to take a more or less active part in the business, which they took over entirely in 1884. During the five following years they worked for various Austrian, German and French publishing firms, but for some twenty years past have chiefly confined themselves to the production of colour prints for a German art publishing house. In the earlier period they did many pictures from the designs of Professor J. Klein, including a series of twenty forming a "Rosary," and fourteen others illustrating "The Way of the Cross." Religious subjects also form the bulk of those dealt with in the prints executed for the German firm, and in most cases they are copied from paintings by the Old Masters in various Italian Museums and Art Galleries, as well as in the Royal Gallery at Dresden and the National Gallery in London. They are reproduced entirely from wood

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RUDOLF KNÖFLER HEINRICH KNÖFLER

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blocks, in the colouring of the originals, and in several cases there are two or three sizes of each. Messrs. Knöfler are, we believe, the only producers of chromo-xylographs for sale in separate form, and very great care is taken to ensure that they shall be real works of art. The number of blocks used in any one print varies from ten to a dozen, though for some of the larger subjects, such as "The Dance of Apollo and the Muses," fourteen or sixteen are required. The blocks are engraved by the brothers personally, and they, like Baxter, also give personal attention to every other detail of the work, including the printing. For this latter operation, treadle platen machines are generally used where small pictures are concerned, otherwise the old hand-presses; the size of the prints varies from small medallions an inch in diameter to large pictures like Professor Barabino's "Madonna," 13½ × 8½ inches; or the reproduction of Fra Angelico's "Paradise," in the Fine Arts Academy in Florence, which is 14¼ × 11 inches. The three-colour operator mostly works from designs specially prepared for reproduction by that process, but the Brothers Knöfler tackle all subjects indiscriminately, and endeavour to represent by their method the actual touches of brush or pencil. The degree of success they have attained must be judged from the prints themselves, but we think it will generally be admitted that they have not fallen far, if at all, behind their ideal.

We get some insight into the condition of the non-lithographic printing arts of sixty years since from the Reports of the Jurors at the 1851 Exhibition. They considered that from the period of the abolition of the State Lotteries until about 1832, colour printing fell into disuse, with the exception of the production of official documents like patent medicine labels and embossed postage stamps, which were still printed at the Stamp Office by the method invented by Sir William Congreve, and perfected by Branston and Whiting. The latter's son continued the business, and exhibited some fine specimens of "cameo embossing," now termed die-stamping,

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in colours. As to coloured printing inks, the Jury thought that most of the credit for their recent improvement was due to Mr. De la Rue, though they were of opinion that the red ink then in use was not equal in brilliance to that of the fifteenth and sixteenth centuries. A Glasgow printer, W. Mackenzie, had invented a method of printing in two colours from the same page of type, without lifting from the press, and some specimens of work done by it were shown. Mr. J. S. Hodson, of Portugal Street, Lincoln's Inn Fields, exhibited a number of examples of letterpress printing in colours, and the Exhibition Catalogue contained several specimens of colour work, including an example of "Typochromatic Printing," invented by Mr. F. W. Rowney, of the London art publishing house. The colours were applied from wood or metal, and the picture was generally made up from them, as the usual outline block was not used. Rowney subsequently published some "Water-colour engravings" produced by this process, including a series of "River Sketches" by R. P. Noble, though both design and colouring were of a rather elementary order. Leighton's process was represented by the publications of the firm for which he principally worked, Cundall & Addey.

Of the numerous British firms who did colour printing from relief surfaces during the latter part of the last century, space will only allow a reference to a few. Messrs. Cooper, Clay & Co., of London, produced in 1869, for Sampson Low & Co., an edition of Gray's *Elegy on a Country Churchyard*, in imperial octavo, illustrated by sixteen full-page plates in colours, printed in a style which suggests that something had been borrowed from both Leighton and Knight's methods. The colour blocks had a rough grain, and the pictures were completed by the printing of the outline block in black. Similar work is seen in *The Twelve Parables of Our Lord* (Macmillan, 1870), which contains a title-page and frontispiece slightly reminiscent of Baxter's work, as well as several other coloured illustrations by the same firm.

So far as its style and character are concerned, one of the

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most original examples of colour work, as applied to juvenile books, is the facsimile reproduction for Eyre & Spottiswoode, in 1888, of Dick Doyle's MS. account of *Jack the Giant Killer*, compiled by that famous artist in 1842. There are coloured illustrations and borders to every page, from which we can gather that even in his boyhood's days "Dicky" was an artist of no mean powers, and was brimful of the humour that characterised most of his later work. The Brothers Dalziel are not generally known to have engraved for colour printing, but at least one work was illustrated by them in that way, and printed at their establishment. This is *Odes and Sonnets* (Routledge, 1859), which contains a number of wood engravings after Birket Foster, printed in brown, and coloured from two tone blocks. The volume also has a series of head and tail-pieces and ornamental initials in three colours, as well as a half-title, frontispiece title, and general title, these being printed in about half a dozen colours from wood blocks. Most people will probably prefer the tinted illustrations to the decorative colour work, which is not of a very high order. A title-page of similar character, entirely printed in colours from wood, occurs in Ann Taylor's *My Mother* (Partridge, 1867), but the full-page coloured woodcuts are of an altogether different type from those in the Dalziel volume; there being no imprint, the writer cannot say by whom the book was produced. Walter Hay, a London machine wood engraver, has done a lot of wonderfully good colour block work by engraving the tints on the wood engravers' ruling machine.

Old provincial examples of colour printing are not very plentiful, although two or three firms seem to have made a sort of speciality of this class of work about the middle of the last century. Among them was Binns & Goodwin of Bath, who produced Bannister's *Pictorial Geography of the Holy Land* in 1851, with every page surrounded by vari-coloured rule borders. Books with coloured borders to the pages were rather popular at the time, and a Liverpool typographer, David Marples, excelled in that direction; a good specimen of his

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work is *A Bridal Gift* (1847), in which the borders are really artistic examples of pure chromo-typography. This is not mere "combination" work, but a series of well-designed decorative ornaments in almost infinite variety, with coloured head and tail-pieces, initials, etc. They are frequently in two colours, printed by successive operations, and the sectional titles are in five tints, including black and gold; the letterpress colour printer of to-day might gather many useful hints from this charming little volume. Coloured border work of a very similar character, perhaps inspired by Marples' work, occurs in *Guess if You Can* (Bogue, 1851), which was printed by Vizetelly. In Bernard's *Comforts of Old Age* (6th edition, Longmans, 1846) every page is surrounded with a broad decorative border printed in blue by E. Rogers, of Shenley, presumably the Herts village of that name. A two-colour title was originally provided for this volume, but the one ultimately adopted is in the same style as the text pages. Adams' *Oriental Text Book and Language of Flowers* (London, 184–) has the text printed by Dean & Son in various coloured inks, every page having a broad floral border, generally in one colour on a tinted ground, so that three printings were necessary, but the inks used for the decorative work are pale and washy, and the designs poor. The cloth covers are printed in gold and colour, an early example of the kind. The only other specimens of letterpress work in colour to which space will permit mention are those got out in the forties by M. A. Richardson, of Newcastle-on-Tyne. A volume of *Poems* by the Rev. R. C. Coxe, M.A., Vicar of Newcastle (1845), has the lettering of the title in red, blue and black, within a woodcut border in five colours, although one or two of these may have been put in by hand, as was certainly the case with the colouring of some of the ornamental initials, a few of which, however, were printed in three colours, there being also some head and tail-pieces in colour. According to the Preface, the work was produced in this manner "from a desire to encourage meritorious local talent, and for the credit's sake of the Provincial

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Press." Thus encouraged, Richardson went a step further in *The Alien Child's Holy Christ* (1846), which has a five-colour title of similar character, and also exhibits a praiseworthy, though not wholly successful attempt to produce, from wood blocks, large four-colour initials of mediæval character. Two-colour initials are plentifully sprinkled through the pages, as they are also in the *Christmas Carol* for 1847, the text of which opens with a large red and blue initial on the lines of those in the early Mentz Psalters. Richardson was evidently a printer possessed of some taste and originality.

Five-and-thirty years ago the old aquatinting method had a new lease of life, in much the same modified form, for colour printing, as that in which Leighton used it. This was due to Mr. Samuel J. Hodson, a well-known water-colour artist, and son of the first Secretary to the Printers' Pension Corporation. His " Chromographic Process " had a pedigree which might be traced back to Leighton, to whom Hodson was apprenticed, although when his time was up he turned his attention to painting instead of printing. One day, long afterwards, he met his friend Edward Whymper, of Alpine fame, who was himself an artist, and worked in that capacity to illustrate his own books as well as those of others. He thought there was an opening for a new colour-printing process, and broached the subject to Hodson, knowing his past connection with that branch of the trade. Hodson hit upon aquatint as the method most suitable to use for the purpose, and having perfected his adaptation of it, got out some specimen prints, of which an excellent one, " The Village Blacksmith," produced in thirteen colours on an " Albion " press, may be seen in *The Circling Year* (1871). Soon after this the process came under the notice of Mr. W. L. Thomas, founder of the *Graphic*, and in the Christmas, 1875, number of that periodical appeared a plate by Mr. Hodson, entitled " Missed," after a water-colour sketch by Miss E. Thompson. From that time until 1898 Mr. Hodson, with the aid of his assistants, supplied the blocks for all the special presentation colour plates which

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appeared in the *Graphic*. Many of them, such as Sir J. E. Millais' "Cherry Ripe" (1880), of which over half-a-million copies were issued; Sir F. Leighton's "Desdemona" (1890); Luke Fildes' portrait of H.M. the Queen (1894) and his "Shepherdess" (1897), and Lord Leighton's "Flaming June" (1896), will be familiar to most readers of this volume. In the last named, as in some other plates produced by this process, a wood block was used to give a small part of the outlines, but most of the prints were pure aquatints, so far as the method of producing the blocks was concerned, the grounds being prepared and the tones etched in the usual way, and casts taken from the plates subsequently, for relief printing. There was a plate for each colour, four or five being the average number used, though sometimes as many as nine were called for. Compared with the three-colour process that has now taken its place in the *Graphic*, Mr. Hodson's method was of course slow, but whether it in any way suffers by comparison is a matter that can safely be left to the judgment of the artistically minded. Noble's *Colour Printing* (1881) contains a detailed account of the various processes necessary for the production, by this method, of the coloured plates for the Christmas, 1879, number of the *Graphic*.

The age of coloured book illustration in France did not begin until the eighties, but a couple of minor examples of an earlier period may be mentioned. An edition of De Sacy's translation of the Four Gospels (*Les Evangiles*), published by Dubochet et Cie, at Paris in 1838, was illustrated with woodcuts and decorative borders in the fashion of Knight's contemporary edition of the Book of Common Prayer. The lettering of the half-title is in red and black, on a reticulated background of "combination" character, printed in blue and arranged in the form of a cross, surrounded by a border also in blue. The "Sainte Veronica" frontispiece is in black, red, gold and light brown, and faced by a very elaborate ornamental title-page, printed in red, blue and gold, probably from wood blocks. The volume also contains

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several other sectional titles in red, blue and black. An edition of De Genoude's French translation of *The Imitation of Jesus Christ*, published at Paris in 1840, has the first title, of pictorial design, printed in brown and black, and a number of woodcuts printed in black and surrounded with an emblematic border in brown are scattered through the volume, which is conceived much on the same lines as the Gospels just referred to.

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CHAPTER VII

CHROMO-LITHOGRAPHY

SECTION I

FROM THE INVENTION OF THE ART TO 1850

THE art of lithography, invented by John Aloysius Senefelder, of Munich, in 1796, depends upon a very simple principle, viz., the attraction which calcareous stone has for water and greasy substances, and the want of affinity between the two latter. A slab of this stone having been duly polished and prepared, is written or drawn upon with, for example, a crayon in which the colouring medium is mixed with fatty or greasy materials; a damp roller being then passed over the stone, the surface of the latter absorbs the moisture, which is, however, repelled by the greasy lines of the design. A roller charged with a greasy ink being next passed over the stone, the ink is repelled from the damp surface, but taken up by the lines of the design, and by them transferred by pressure to a sheet of paper, in the form of a copy of that design. The principles which govern the art of producing pictures by chromo-lithography are the same as those which apply in the case of chromo-xylography, *i.e.*, the complete design being first prepared, and the number of tints in which it shall be reproduced decided upon, that portion of it which is to be in a particular colour is drawn on the surface of a litho stone, and so on with the other colours, each on a different stone, the print being built up by the successive impressions from the colour stones. The use of coloured, in place of black, ink in lithography dates from the early years of the process, which was introduced into England in 1800 by the inventor

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himself, and a collection of facsimiles of drawings produced by it published in London in 1803, under the title of *Specimens of Polyautography*. One or two of these are printed in the so-called "Bartolozzi" red tint, but the first lithographed publication of any importance in which coloured inks were used was probably the reproduction at Munich, in 1808, by Strixner & Piloty (perhaps under Senefelder's superintendence) of the illustrations drawn by Durer in 1515 on the margins of a Prayer Book in the Royal Library at Munich, formerly belonging to the Emperor Maximilian I (*Albrecht Dürer's Christlich—Mythologische Handzeichnungen*). Each of the pages reproduced—the text was not included—was in a coloured ink in facsimile of the original, green, purple, sepia, puce, etc. When Rudolf Ackermann (1764-1834), who may be regarded as the real populariser of lithography in England, started his Lithographic Press in London in 1817, a facsimile of the Munich volume of 1808 was its first important production. In this the title-page, and also a page of the text of the Prayer Book, prepared specially for this edition, were printed in red and black. In 1908 a complete edition of the work was published at Munich by F. Bruckmann, the reproductions being made by photo-lithography, and printed in from four to eleven tints. Some of the drawings are by Lucas Cranach, and facsimiles of these were issued as a separate volume at Munich in 1818, also printed in tinted inks, a couple of pages being in two colours. A little volume produced at Munich in 1809, by Senefelder, contains some maps illustrating the boundaries of Bavaria at different periods, the frontiers being indicated by thick lines printed in red and blue, but this is rather a poor effort of the chromo-lithographic art. In the Print Room at the British Museum is an early nineteenth century lithograph of a beggar, with the outlines printed in three or four colours, apparently at a single impression, the inking being done by hand, but the experiment does not seem to have been repeated.

A very early—possibly the earliest—lithographic printer

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to produce decorative designs in several colours was J. A. Barth, of Breslau. As early as 1811 he issued some lithographed illustrations coloured by hand, and in 1816 produced the first edition of a work entitled *Pacis Monumentum*—a polyglot record of the main facts connected with the Peace of 1815. This is a folio volume, in which many pages of the text are surrounded by an ornamental border printed in a single colour, but more probably from wood or metal surfaces than from stone. A second edition was published in 1818, and on this occasion the printer replaced the borders in monochrome by others lithographed in several tints, five or six in some cases. The colours are laid on flat, as usual in early examples of chromo-lithography, and the register is not particularly good, though the colours are bright; a circular design on the title-page is printed in brown on green, with four gold stars above it. According to a passage in the Preface, the coloured borders in this volume exhibit the results of an attempt at printing in colours entirely from stone, without any subsequent retouching by hand (*qua lithographus sine ullo penicilli adjumento figuras coloratus efficeret*). Some of the pages have head-pieces only, but still printed in colours. Artistically considered, the designs are rather crude, but their position in relation to the history of colour printing gives them a special interest. This appears to have been an entirely independent effort, and as such stands alone.

The common method of producing colour effect in lithography, for the first thirty years or so of the last century, was probably suggested by the old chiaroscuro prints, the outlines being printed in black on a coloured ground, which had the lights scraped out, although in some instances the ground was solid and the lights indicated on the print by hand in Chinese white. In this way a three-colour picture was produced by two printings. An early example of what may thus be termed the chiaroscuro lithograph is the portrait of Senefelder which appears in his *Complete Course of Lithography*, published in Germany and England (London, R. Ackermann) in 1818-19.

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This is in black and brown, and the same volume contains a facsimile, in red, blue and black, of an initial in one of the early Mentz Psalters. Several references to the possibility of printing pictures in colours from stone, in imitation of oil paintings, were made by Senefelder in the work in question, but the idea does not seem to have been carried out in practice at that period, the chiaroscuro effect being preferred, no doubt owing to its simplicity and comparative cheapness. The coloured ground was most commonly of a lemon tint, though what is now often called a Rembrandtesque effect was obtained by using a pinkish tone. Engelmann (1788-1839) did this at Paris in the early twenties; three-colour work was also practised as early as 1820, a black print on a toned ground being sepia-tinted in the shadows from a third stone. Some of the finest examples of tint work in lithography are to be seen in the series of reproductions (*Die Sammlung*, etc.) of pictures in the Munich Royal Galleries, that was produced in thirty-eight parts from 1820 onwards for a number of years, under the direction of J. N. Strixner, some of the plates being lithographed by himself, though the printer of most of them was B. Berner. In these the tint does not cover the whole of the background, but only where it will produce a particular effect, parts of the surface being left uncoloured; even in some of the later prints of this series the high lights are indicated by hand with a brush. These methods of producing coloured, or rather tinted pictures, by printing lithographic designs on black on a coloured ground, were described and illustrated by C. J. Hullmandel in his *Art of Drawing upon Stone* (London, 1824), and by Engelmann—in whose studio Hullmandel had perfected his knowledge—in the *Manuel du Dessinateur Lithographe*, published in Paris about the same time.

Chromo-lithography properly so called, as distinguished from the black-and-tint work just alluded to, may be considered to date from the issue of the *Pacis Monumentum*. The next experimenter in this direction seems to have been Franz Weishaupt, of Munich, who prepared in 1822 about

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sixty botanical plates, lithographed in colours, to illustrate a work on Brazil by Martius and Spix. Hitherto, the Bavarian capital had carried off most of the honours in connection with the production of lithographs in colours, but probably the finest exemplification of pure chromo-lithography in the twenties occurs in the plates for the early parts of Wilhelm Zahn's splendid work on the remains of ancient pictorial art discovered in the buried cities of Campania, *Die Schönsten Ornamente und Merkwürdigsten Gemalde aus Pompeji, Herkulanum und Stabiæ*. This is a very large folio, the pages measuring about 24 × 30 inches, and the three volumes of which it consists were over thirty years in passing through the press, the first few parts being published in 1828, and the last in 1859. All the plates are not in colours, but the task of printing those that are was apparently divided amongst several lithographic houses, including J. Storck, C. Hildebrandt, C. G. Herwig, and the Prussian State Printing Office. They reproduce, in the colours of the originals, wall paintings, friezes, mosaics, etc., four or five tints being usually employed; the title of the first volume is printed in red, and surrounded by an ornamental border in colours, the imprint being "*In farbengedruckt in dem Lithogr. Institut von J. Storck.*" The same lithographer produced most of the plates in the early parts, as Hildebrandt's name does not appear until Part 63 is reached (1829). Here and there, where small or narrow patches of colour had to be applied, we find some hand-work, but, speaking generally, it may be said that the colour plates are genuine chromo-lithographs. The art of printing blended or superimposed colours from stone belongs to a later period, and hence we find that these Berlin pictures are coloured by plain flat, solid tints, including black when necessary. Stippled lithographs in colours were also rare at this time, and there is only one such in the first volume of Zahn's work, although there are several in the second, which was completed in 1842, one being by H. Delinsand, another by Hildebrandt. The latter was also engaged in the production of the colour plates

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for C. H. von Gelbke's *Abbildungen der Wappen Saemmtlicher Europalischen Souveraine*, a work on the Armorial bearings of the various European States (Berlin, G. Reimer, 1832). These are mostly in five or six tints, though in a few cases more are used, and in some instances gold and silver was applied from the stone to give a correct rendering of the quarterings, etc. A little hand-touching is visible, but there is less reliance on it than in most of the earlier examples of the chromo-lithographic art.

The possibility of producing coloured pictures by the adaptation of the three primary colour process to lithography received attention in the thirties, at the hands of Henry Weishaupt, of Munich, and others, but the result was not considered satisfactory, probably owing to a want of transparency in the inks, and as more than three colours were generally used in chromo-lithographs even at that time, the tendency ultimately was rather to increase the number of colour stones than to confine it to a series of three. F. M. Hessemer's work on—*Arabische und Alt Italienische*—decorative art (Berlin, 1842), contains 120 plates lithographed in colours by H. Delins, but there is nothing remarkable about any of them, nor are they improved by being printed on thin paper, unmounted.

It will be seen that Germany led the way in chromo-lithography, as in most other branches of the graphic arts. We have now to consider French work. The first permanent lithographic printing establishment in Paris was opened by Godefroi Engelmann about 1816, the Comte C. P. de Lasteyrie du Saillant starting another a few months later, under the auspices of Louis XVIII. The Comte is said to have experimented in colour work almost from the first, and produced some reproductions of Greek vase paintings in two colours, red and black, but Engelmann does not seem to have done much in this line for some years. Originally a designer in his native town of Mulhouse, family misfortunes compelled him to seek a living elsewhere, and he acquired a knowledge

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of lithography at Munich in 1814, subsequently putting that knowledge into practice for a year or so at Mulhouse, before going to Paris. As early as 1828, the Société d'Encouragement pour l'Industrie Nationale at Paris had offered a prize of 2,000 francs for the invention of a practical method of printing pictures in colours by means of lithography, but whether claimed or not, it had not been awarded to anyone prior to the time when Engelmann started his experiments in that line in the thirties. By the latter part of 1836 he had brought his process to a tolerable degree of perfection, and patriotically decided to communicate the particulars of his success to the Société Industrielle du Mulhouse (which is still to the front in encouraging art and industry), of which he was a member. His letter was read at a general meeting of the Society held on December 21st, when several specimens of his work were exhibited, and on January 15th, 1837, Engelmann obtained a French patent for ten years for his invention, to which he gave its present name of chromo-lithography. Having thus secured his right to exclusively operate the process, there was no longer any danger in making the details public, and accordingly some members of the Société d'Encouragement, constituting a committee to examine the merits of his invention, were permitted to see his methods in operation, and to pull a few impressions themselves. Their report being satisfactory, Engelmann was awarded the long standing prize of £80. In order that the value of his invention might be similarly recognised by the Mulhouse Society, several members of its Fine Arts Committee were likewise allowed to see his lithographic colour printing process in operation. The Committee's report on the subject was read at a meeting of the Society held on March 29th, 1837, and must have been a very satisfactory one from Engelmann's point of view, the utility and importance of the invention being strongly dwelt upon by those who had had the advantage of seeing it at work. The Society, however, waited until June of the following year before giving effect to its Committee's opinion, so

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GODEFROI ENGELMANN

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as to be satisfied that there was no hitch in the commercial development of the process, and on the 13th of that month decided to present Engelmann with a gold medal.

Although that well-known lithographer no doubt made valuable improvements in the process of producing coloured pictures by lithographic methods, there is not really much more than these, and the invention of the name of this branch of art, that can be justly attributed to him, seeing that prints lithographed in colours had been produced in Germany many years prior to his entering the field. His colour printing department was at first on a very small scale, only a couple of men being employed, each of which could turn out 100 quarto pictures per day. It is almost needless to say that only hand-presses were used in his establishment, as litho machines were not introduced until the fifties. He seems, however, to have designed special presses for his colour work, and illustrations of them will be found in his *Traite de Lithographie*, published at Mulhouse by his son Jean in 1840, the year following the elder Engelmann's death. The title-page of this volume is printed in colours by his process, but is anything but a noteworthy example of chromo-lithography; in fact, the firm's finest work in this direction is due to the son, who took an expert lithographer, Aug. Graf, into partnership, and from the forties onwards produced chromo-lithographic plates of a high order. An excellent example is the series prepared for the French Government in 1845, illustrating the paintings in the Church of St. Savin in Poitou. The old flat-tint method has here practically disappeared, and replaced by a judicious blending of colours that foreshadowed the coming of the present type of chromo-lithography, although the colouring is somewhat faint and cloudy. The earliest French book, illustrated by chromo-lithography, which could in any way be compared with Owen Jones' *Alhambra*, was Lacroix & Seres' *Le Moyen Age*, published in five quarto volumes in 1848-51.

We have now briefly traced the process of printing lithographs

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in colours down to the Victorian era, but it must not be supposed that the multi-colour print promptly displaced the old black-and-tint work, or even the ordinary black-and-white print. On the contrary, the majority of press-coloured lithographs in the thirties and forties are of the black-and-tint type, the lemon or salmon-coloured ground being almost a distinguishing feature of this period. Hand-coloured lithos are even commoner still, this method being often employed on prints of the black-and-tint species. The various isolated attempts to establish lithography on a firm footing in England, that had been made from 1800 to 1815 by Senefelder, André, Bankes and others, had all ended in failure, and it was of course left to the ubiquitous German (*i.e.*, Ackermann) to do what the native practitioners had not succeeded in. But after the first few years, Ackermann's publishing interests developed in other directions, most of his books being illustrated not with lithographs, but with aquatints or steel engravings.

By the twenties, however, the commercial as well as the artistic advantages of lithography had come to be—albeit somewhat tardily—recognised in England, and so the art was being practised as a business, though only on a small scale, by several firms. The earliest of these seems to have been that founded by Charles Joseph Hullmandel (1789-1850), the first English-born lithographer who attained to any degree of note in that trade. He learned the details of the art in Germany, and started work on his own account in London as early as 1818. The artistic side of lithography appealed more to Hullmandel's instincts than the utilitarian, the latter being handled by an ex-law writer, William Day, who commenced business in Great Queen Street, Lincoln's Inn Fields, about 1823, afterwards removing to Gate Street, hard by. Chromo-lithography was still in the womb of the future at this period, so far as England was concerned at any rate, and neither Day or Hullmandel seem to have made any serious essays in that direction, it being left to two outsiders to lead the way. The first of these was Thomas De la Rue,

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OWEN JONES

CHAS. JOSEPH HULLMANDEL

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a member of a well-known London printing firm, who patented in 1832 a process of printing playing-cards in oil colours by lithography, in place of the old method of stencilling them. His specification goes into a great deal of elaborate detail, the text being elucidated by sixteen sheets of drawings. He secured correct register by means of pins and point-holes, the former of which were at the corners of a steel plate laid over the sheet to be printed, the latter being in the stones themselves. De la Rue, being more interested in the production of playing-cards than in the development of colour lithography, mentions that wood or metal surfaces could be used in place of stones, for the purpose of applying the colours. He used strong, quick-drying inks, boiled with linseed oil.

Chromo-lithography, although thus debased, on its first formal introduction to this country, to provide for the needs of the gambler or card-sharper, was yet destined to rise to higher things, through the enthusiasm of a man who had no connection with the trade at all, viz., Owen Jones (1809-1874). He was a London Welshman, who, after being educated at the Charterhouse and elsewhere, was apprenticed in 1825 to Vulliamy, the architect, and remained with him for five years. He then followed the example of the German art student, and wandered in many lands, sketching and picking up all sorts of ideas and *motifs* on decoration, which in after years he turned to good account. In 1834 he was in Spain, in company with a friend of his, Jules Goury, and seems to have been particularly struck with the then neglected architectural glories of the old Moorish palace at Granada, so well known as the Alhambra, a large part of which had been destroyed long before by one of the Spanish Sovereigns, whose architect replaced several of its halls and courts by an ugly Renaissance building of his own design. What remained—and fortunately still remains—of the original structure furnished Jones with a wealth of decorative detail, which he was not slow to utilise, as he determined to do for the Alhambra what Murphy had done many years before for the great Portuguese fane

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at Batalha, *i.e.*, prepare an absolutely exhaustive illustrated monograph upon it. In his *Arabian Antiquities of Spain*, Murphy had also treated of the Alhambra, but the blaze of colour on its walls and ceilings could in no wise be realised from the line engravings with which that work was illustrated. So Jones set to work with pencil and brush, and copied most of the finest detail in the size and colour of the original; whilst so engaged, his friend Goury died of cholera, and though his work was still unfinished, the untoward event so disturbed Jones that he abandoned his painting and sketching and returned to England. Arrived there, he set about arranging his drawings with a view to preparing the plates for his proposed great work. What led him to choose lithography as his productive method cannot now be certainly known; possibly he had heard of, or seen, what was being done on the Continent by that art in the way of colour work, although it must not be forgotten that in 1835 there was, except Baxter (then comparatively unknown), no colour printer in London save De la Rue. Jones made proposals to the few lithographers there, but with the exception of Day the intricacy and magnitude of the task appalled them, and they professed themselves unable to do the work. Some years previously, Day had had the advantage of securing the services of a young Belgian artist, Louis Haghe (1806-85), who speedily made a name for himself, not merely in the trade but in the world of art, by his spirited renderings on the stone of pictures of Continental life and architecture. But as Day's firm was probably not in a position to do the whole of the work required, Jones resolved to set up a lithographic printing establishment on his own account, at his residence in John Street, Adelphi. He purchased presses, stones, inks and all the other necessary materials and engaged a staff of competent workmen. These preliminaries being settled, the work was put in hand, and by March, 1836, nearly a year before Engelmann, the self-styled inventor of chromo-lithography, took out his patent, that art had made its debut in England, through the medium of

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some of the illustrations for Jones's *Plans, Elevations, Sections and Details of the Alhambra*. Though conceived and carried out on a magnificent scale (many of the plates are 28 × 16 inches) it can hardly be said that this is an interesting work from an artistic point of view. The inclusion of a few interior and exterior views, in colour perspective, would probably have greatly assisted the sale of the book, but as it was it turned out a comparative failure. Many of the illustrations are line engravings, but much of the colour detail was represented in facsimile by chromo-lithography, six or seven tints being used as a rule; except in the shadows, the colouring was usually applied flat, as the nature of the work did not call for any other mode of treatment. Much of the mural decoration of the Alhambra is elaborately gilded, but this in no wise disconcerted Jones or Day, who printed gold by lithographic methods with the same facility as other lithographers printed black.

This was almost a new branch of the printing art in England, as hardly anything of the kind had been done before by any method, and so calls for some attention here. A little volume published in the Spring of 1818 in connection with the death of the Princess Charlotte (*The Beauties of Sincerity*) had four lines on its title-page printed in gold, a circumstance which was thought of such importance as to warrant it being specially mentioned, on the label on the front cover, that "The prominent parts of the Title of this Volume are printed in Gold." The printer was W. Clowes, now a familiar name in the trade, but a greater than he—in the exposition of the art of printing in gold—arose in the person of John Whittaker, a Westminster bookbinder, who made use of the process of stereotyping, which had not long before (1804) been introduced by Earl Stanhope—the inventor of the press which bears his name—in conjunction with Andrew Wilson. Whittaker was rather a gold blocker than a printer, as he used heated stereo plates to apply his gold to the sheet, but his work is of too remarkable a character to be passed over here. It finds its earliest public

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expression in a splendid reprint of the text of Magna Charta, issued about 1816. George III's copy is in the British Museum, a gorgeously produced folio, in which the text is printed in gold on sheets of extraordinarily thick vellum, which are, however, heavily embossed on the back. A good deal of decorative ornament is supplied by hand—the hand of John Harris, whose skill in imitating ancient lettering and miniature painting was almost unrivalled. The Society of Arts was so impressed with Whittaker's work that the Secretary informed him that a premium would be awarded for it, subject to the usual condition, viz., that particulars of the *modus operandi* were communicated. This, however, Whittaker declined to do, preferring instead to keep his methods secret, and it was not until after his death that his faithful helper, Harris, disclosed the details. Whittaker's art has its best exemplification in that magnificent volume, *The Ceremonial of the Coronation of His Most Sacred Majesty, King George the Fourth*, published in 1822. So far as Whittaker was concerned, it may be described as a large paper edition of his own gold letterpress work, the ample margins of the huge folio pages being filled with pictures illustrating the personages and costumes seen at the Coronation. In the writer's copy these are missing, but Whittaker's work is intact. On that part of the leaf which was intended to receive the impression in gold (the text is mainly a list of persons who walked in the procession) a solid ground tint, usually cream, scarlet or dark blue, was first laid down, and then apparently treated with some glairé mixture, in order to "fix" the gold. Great pressure was used in applying this latter, as notwithstanding that the material of the leaves is stout cardboard, the back is strongly embossed. Each leaf is ensigned by the Crown and other regal emblems, also blocked in gold, occasionally against a faintly tinted background, and there is a gold-line border round each page, with floral ornament in the upper corners, likewise in gold. In spite of the gorgeousness of their "get-up," few of the pages are really effective in appearance, owing

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largely to the way in which the text, mostly in plain roman letter, is crowded upon them. The title-page, in which the *engraved* text is arranged in a circle surrounded with the collar and pendant of the Order of St. George, is perhaps the best. It is followed by a pictorial one, in which is represented the regalia on the Altar at the Abbey ; in this the gold is blocked on a background made up of six different colours, scarlet, blue, purple, black, cream and green, but from a decorative standpoint it is a page that could have emanated from the brain of no one else but a bookbinder, being overloaded with tawdry and wretchedly designed ornament, much of which appears to have been applied from bookbinders' " tools," no doubt some of Whittaker's stock-in-trade. On the third page is a large historiated initial A, in gold on a red ground, which lends an appearance of dignity to the commencement of the text.

De la Rue's firm also printed in gold, and about 1830 produced for Balne, a London publisher, an edition of twenty-five special copies of the *New Testament*, which were printed throughout in gold. The same firm also gilded—Clowes *printed*—the Coronation number of the *Sun* newspaper (June, 1838), the text of which was rubbed over with a mixture of varnish and gold-size whilst the sheets were still wet from the press, and bronze powder then applied. Printing in gold has since become too common to call for further attention, though it may be mentioned that an edition of the *Golden Gospel* (St. John's), with a lengthy introduction by J. R. Macduff, D.D., was produced entirely in gold, by Marcus Ward & Co., of Belfast, in 1885. A process of printing visiting cards, etc., in gold from engraved copper plates was introduced about 1830 by a foreigner named Sturz, but was soon abandoned as being too expensive.

From this digression we return to Jones's *Alhambra*. This work was published in two volumes, the first of which—consisting of ten parts—was completed in 1842, and cost £12 10s. on small, and £21 on large paper. It is curious that French

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sizes of paper were used, viz., " Grande Aigle " and " Colombier." Volume II, *Details of Ornaments*, finished in 1845, was in two parts, issued at from £3 3s. to £5 5s. each, according to size. For the material of many of the prints it contained, Jones had to make a second journey to Granada in 1837, in order to complete the task which Goury's death had caused him to leave unfinished.

Engelmann was allowed to remain in possession of his proprietary name of " Chromo-lithography," as designating the process of printing in colours by a planographic method, both Jones and Day simply saying that the pictures in the *Alhambra* were " Printed in colours by Day and Haghe " or by Owen Jones, as the case might be, the latter usually prefixing " Drawn, lithographed and published by." A point of special interest about the work is the fact that Jones printed many of his coloured lithographs from zinc. The employment of plates of this or some other metal, in place of stone, had been suggested by Senefelder himself as early as 1801, in his English Patent Specification, and some thirty years later this old idea was re-patented, and the process operated by Chapman & Co., of Cornhill, an example of whose lithography from zinc will be found in the first volume of the *Railway Magazine* (1835). In 1840, another London firm, Davis & Hills, produced by zincography a series of prints of the caricature order, for Tregear, a Cheapside publisher.

Chromo-lithography having thus been successfully inaugurated in England by Jones, he continued to operate his lithographic printing establishment in the Adelphi (later on he moved to Argyll Place, Regent Street) for many years after the Alhambra plates had been completed, and produced coloured lithographic illustrations, and sometimes complete books, for various London publishers. His special line was what was—and still is—known as the " illuminated " book, from the resemblance of the decorative parts to (many of the details were in fact often taken from) those so often seen in ancient MSS., in which, as well as in these modern imitations,

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gold and colour were profusely used. Longmans were very good customers of Jones for this sort of thing, and a few examples may be mentioned. One of the first was *The Prism of Imagination* (1844), a collection of tales, in which every page was surrounded by an ornamental border printed in colour or in gold. There were separate titles to each tale, printed in gold and colours, as was also the opening page of the tale; the illustrations were in black-and-tint, although one, "The Miniature," was in blue, black and brown, within a border partly printed in gold. A more finished style of work is seen in the eight separate title-pages Jones did for Murray's 1845 edition of the Book of Common Prayer, printed by Vizetelly as already mentioned, and the illuminated books proper may be dated from the same period. One of the best, if not indeed *the* best, is H. Noel Humphreys' *Illuminated Books of the Middle Ages* (Longmans), the production of the plates for which extended from 1844 to 1849. They are magnificent pieces of colour printing, representing specimen pages of MSS. from the fourth to the seventeenth centuries, and according to the title-page, were "executed on stone, and printed in [gold, silver and] colours by Owen Jones." This, however, is not strictly correct, as some of the plates were "printed in colours by C. Graf." This was probably the man who, with M. Coindet, represented Engelmann in London from 1826 to 1830. Although Engelmann thought him a poor business man, he seems to have been a very good colour lithographer, and imitated Jones in producing work of the "illuminated" character, with much gold, gothic lettering, and floral ornament in colours. One plate in Humphreys' book, representing a page from a MS. Chronicle executed for Edward IV, was "printed by Quinet's chromo-lithography," though it also bore the imprint of "Day & Haghe, lithographers to the Queen." Some of the pages in this grand volume are of exceptional beauty, such, for example, as the reproduction of a page from the *Hours* of the Duc de Berri, a veritable triumph of the colour printer's art. Two other

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works, illustrated by Day & Haghe at this period, though on a more modest scale, may also be referred to. The first is Essex's *Illustrations . . . of the Temple Church, London*, published by Weale in 1845, in which there is a number of plates depicting the mural decorations in the colours of the originals, and also one of the altar-piece in gold and colours, this latter being lithographed at Jones's establishment in Argyll Place. For Lieutenant-Colonel Sleeman's *Rambles and Recollections of an Indian Official* (London, 1844), Day & Haghe did a considerable number of chromo-lithographic plates, including several reproductions of miniatures, an inch or less in diameter, but all printed in colours.

Of the smaller illuminated books, *The Sermon on the Mount* (1845) is a good specimen; the text is in black letter, with coloured initials, the larger of which are on a gold ground. Each page of text is within a floral border of varying design, printed in colours, often against a solid gold background. On the first page there are only a few words of letterpress, the rest of the space within the border being occupied by an illustration, which was coloured by hand in tints to harmonise with the presswork. From 1845 onwards, for several years, Longmans issued an "Illuminated Calendar," the decorative elements of which were copied from some notable mediæval MS. The *Hours* of Anne of Brittany furnished those of the Calendar for 1845, in which the floral borders were lithographed in colours by Jones, but the miniatures had only the outlines printed, and were then coloured by hand. In the Calendar for 1846, however, these latter were lithographed in colours. The Calendar for 1848, in which the illuminations were based on those in the fourteenth century *Hours* of the Duke of Anjou, in the Royal Library at Paris, is a beautiful example of colour printing, in several respects. Noel Humphreys wrote a preface and introduction, and this part of the volume is printed in large gothic type, in red and black, the calendar following being in the same style, but set in smaller type. The appearance of this part of the work suggests that

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the Chiswick Press did it, but there is no imprint to either the letterpress or lithographic sections of the volume, though the latter was possibly the work of Jones. Even the cover of the book is decorated in gold and colours. Many people are apt to think that the modern " Book Beautiful " originated with the late Wm. Morris, of Kelmscott Press fame, but he was still a child when men like H. Noel Humphreys, H. Shaw and Owen Jones were producing such books, taking, as Morris did, old examples for their models. It is true that when Morris started his Press the output of these Early Victorian illuminated books had long ceased, and that his own books were more remarkable for beauty of typography than for colour decoration, but nevertheless Morris was, in some degree at least, more of a follower than a leader.

The little colour that occurs in the productions of the Kelmscott Press is in the text. In several cases, the *Chaucer* for example, and the *Recuyell of the Histories of Troye*, headings or other passages are printed in red, whilst in a few instances three colours appear. The first work in which they were used was the *Laudes Beatæ Mariæ Virginis* (1896), in which the headings are in red, the woodcut initials with which each sentence opens being alternately in black and blue.

In practically all the illuminated books, the leaves are composed of stout cardboard, perhaps because better register for colours could be secured on thick heavy material of this kind than on flimsy sheets of paper. But the very rigidity of the leaves made it difficult to bind them, as when they were stitched together, their own weight and stiffness pulled the stitches out. In this dilemma—as in many others—a man of evil counsel was not wanting, and in this case the tempter was one Hancock. This individual invented and patented in the late thirties a process which was intended to do away altogether with the thread stitching by which, from time immemorial—in the absence of those modern abominations, wire and staple—the leaves of books had been attached to their covers. This was effected by a solution of caoutchouc,

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by which the inner edges of the leaves were united to the flexible back of the volume. Judging from the multitude of books, from the *Keepsake* of 1839 onwards, that were "bound" by this means, the method was a success for the time being, but as years rolled on the moisture in the solution evaporated, leaving the residuum of caoutchouc in the form of a dry powder, so that the leaves become detached almost at a touch. Hence many of the illuminated colour books of the forties and fifties are found with the leaves loose, and their edges dirty and frayed in consequence.

In 1849, Jones produced for Longmans a charming little edition of the Matrimonial Office in the Book of Common Prayer, with the text in gothic type as usual, printed in red and black within decorative borders in gold and colours. In its original binding of cream-coloured leather, embossed in gold with a design of the *Alhambra* type, this is one of the most beautiful little volumes of its kind. In the same year appeared an "illuminated edition" of *Ecclesiastes, or the Preacher*, a folio volume in which the text, still in red and black gothic type, was of a much bolder cast, the border being in many pages relegated to second place amongst the decorative elements of the book. Material for these latter was often provided by ancient MSS. in Jones's own possession, the pages of practically all his black-letter books being designed on the old lines. This particular volume was enclosed in massive wooden covers, stained black, and carved in high relief with a leaf pattern; each of these covers is ½ inch thick, and the printed part of the book being only about ¼ inch, furnished little more than a fifth of the bulk of the volume.

This was essentially the age of the decorative "publisher's" binding, as distinguished from the hand-tooled variety which is "collected," and many of the works Jones did for Longmans are enclosed in such. In 1846 Jones had produced for Longmans an illuminated edition of Gray's *Elegy*, in which, as the text is short, the greater part of the pages was taken up with border decoration. It was bound in yellowish-brown

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leather, embossed in high relief with a floral design, and is in all respects a very handsome volume. *Flowers and their Kindred Thoughts* (1848) and the companion volume, *Fruits from the Garden and Field* (1850), are uniformly bound in thick bevelled boards, covered with light oak-coloured leather, stamped in blind with the title, surrounded by an appropriate floral design. In both volumes the text is in large gothic lettering, printed in gold, and the coloured plates which alternate with the text pages show pure chromo-lithography, the blending of the colours to simulate the tints of nature being skilfully carried out. With their production, the first chapter in the history of English chromo-lithography, so far as Jones was concerned, may be considered closed, as the important part of decorative artist which he was called upon to play, first for the Great Exhibition building of 1851 and afterwards for its partly transplanted successor at Sydenham in 1854, took up most of his time for the next few years.

But even if we consider him as *facile princeps* in the introduction of the art, other lithographers followed him up pretty closely, at least from the forties. At a still earlier period, the ordinary black and white lithographic print was sometimes entirely overlaid with hand-colouring, as distinguished from the mere tinting of an ordinary black-and-tint picture. There are some good examples of this in *The Sacred Annual* for 1834, which is otherwise interesting from the colour printer's point of view, the illuminated title-page being printed in red, blue and gold from relief surfaces, a tiny circular panel in the centre enclosing a hand-painted head of Christ. The sheets of tissue that protect the coloured pictures have printed on them, within a floral wreath, and in brown or yellow ink, the particular passage of the text which is illustrated.

Hullmandel was never a great worker in the field of colour lithography, though his prints in volumes like *Harding's Portfolio* (1837) show that he could on occasion improve upon the ordinary black-and-tint style of the day. But a better draughtsman than Harding was destined to give him

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his chance, Thomas Shotter Boys to wit, whose series of architectural and other studies are not nearly so well known as they deserve to be. One of the best of them is the folio volume of *Picturesque Architecture in Paris, Ghent, Antwerp, Rouen, etc.* (1839). In the "Descriptive Notice" prefixed to this, it was stated that "the present work being unique of its kind, and the process by which it is produced being entirely new to the public, some account of the means employed" was felt desirable. Accordingly the publisher pointed out that "the whole of the drawings composing this volume are produced entirely by means of lithography, they are printed in oil colours, and come from the press precisely as they now appear. It was expressly stipulated . . . that not a touch should be added afterwards, and this injunction has been strictly adhered to. They are pictures drawn on stone and reproduced by printing in colours, every touch is the work of the artist, and every impression the product of the press. This is the first, and as yet the only attempt to imitate pictorial effects of landscape architecture in chromo-lithography, and in its application to this class of subjects, it has been carried so far beyond what was required in copying polychrome architecture, hieroglyphics, arabesques, etc., that it has become almost a new art." This latter paragraph was evidently aimed at Jones's methods, and the publisher was at the pains to explain wherein lay the difference between them and those of Hullmandel. "In mere decorative subjects," he said, "the colours are positive and opaque, the tints flat, and the several hues of equal intensity throughout, whereas in these views the various effects of light and shade, of local colour and general tone, result from transparent and graduated tints." This gives such an excellent account of the difference between the old and the new processes of lithographing in colours, that we need add nothing to it. The volume under notice, therefore, may be taken as the first published in England containing chromo-lithographic pictures in anything like the modern sense of the term. Thus Hullmandel may be looked

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upon as the inventor, or at any rate the introducer, of the art in this country. It must not, however, be understood from this remark that high-class chromo-lithographic pictures, such as we see produced at the present day, will be found in the book in question. Hullmandel's idea was evidently rather to reproduce by mechanical means the hand-colouring so often seen on early lithographs; on the coloured sets of David Roberts' *Picturesque Sketches in Spain*, for example. This was, in effect, merely a means of indicating by tints the relative degrees of colour seen in costumes, on foliage, or on certain parts of buildings. Where the tints were applied in broad masses they generally produced good effects, but Hullmandel was less successful in investing some of the minor details with colour, the irregular splashes of red, for instance, occurring in some of Boys' views, being often unsightly. It was, in fact, the black outlines that made the picture, the colouring being simply an accessory that would, in some cases, have been better left out. Still, as an example of early work in this line, the volume is of interest, though Hullmandel could scarcely fail to have been sensible of its shortcomings in the way of register, etc., as compared with Jones's *Alhambra*. Perhaps it was this that caused the process—which was not patented, Hullmandel's only patent being for his "Lithotint" process in 1840—to be made little use of, though the ultimate development of chromo-lithography proceeded on Hullmandel's rather than on Jones's method of working. The former used a lesser number of colours than the latter, not more than two or three being usually employed by him on large surfaces. Boys' book was dedicated to him, "in acknowledgment of his many great improvements and highly important discoveries in lithography." Some other sketches by Boys, notably a series of London views (1841), were reproduced by the same process.

A writer in the *Quarterly Review*, at the end of 1839, referred with approval to the manner in which Hullmandel produced Boys' volume of French views, and expressed surprise

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at the fact that twenty-six prints, equal in effect to water-colour paintings, could be bought for so small a sum as eight guineas.

A few years later, after Hullmandel had taken Walton into partnership, the new firm published a large folio "Specimen of Printing in Colours." This was a representation of a group of flowers on a pedestal, in red, green and blue, the lettering being in a central space on a solid gold ground. The whole was surrounded with a border in blue and white, but the work had nothing remarkable about it, being rather on the lines of Engelmann's early efforts.

The art of printing pictures in colours by lithographic methods, not being restricted in England by any patent, soon spread from the great exponents to the little ones, with the result that in the late forties examples of chromo-lithography—of a sort—became fairly common. The *Art Union* for February, 1846, introduced the process to its readers through the medium of a specimen print prepared by one G. Lee, but it was not a very noteworthy example.

Although Engelmann had a branch establishment in London as early as 1826, it was discontinued in 1830, before his colour experiments began, as the concern failed to pay. The practical manager, Michael Hanhart, then started business on his own account; as a fellow townsman and pupil of Engelmann's he was no doubt fully conversant with his old employer's colour work, and with the examples of Jones and Hullmandel before him, resolved to enter the colour printing branch of lithography. His sons were taken into partnership with him, and the imprint of M. & W. Hanhart is more familiar to the student of early colour lithography than almost any other, as the firm was in existence until as recently as 1903. Their early work was in the usual flat tints, and a good example of the use of these in conjunction with gold will be found on the title-page of the *Churchman's Almanac* for 1845. Soon afterwards the firm improved its methods to the extent of printing the colours over each other,

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MICHAEL HANHART

WILLIAM DAY

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in contrasting or blending tints, the results of this new departure being exemplified in Dibdin's *Progressive Lessons in Water Colour Painting* (London, J. Hogarth, 1848). It is stated on the front cover that the designs were "printed with the improved process of chromo-lithography by M. & W. Hanhart, 64 Charlotte Street, Rathbone Place." The pictures are naturally of a rather elementary character, but the chief interest of the volume lies in the fact that the method by which the colouring of some of them is built up, by successive impressions from the colour stones, is demonstrated in detail. For each of the first three prints four stones were used, *i.e.*, black and three colours, and there are thus four "states" of each of them. Considering the small number of colours employed, these are fairly good specimens of chromo-lithography, though the process was still in swaddling clothes to the extent that the colours did not by themselves compose the picture, being only used to colour a black-and-white outline print. Until this practice was thrown off, chromo-lithography can scarcely be said to have really arrived, and the Hanharts were rather long in throwing it off. I. E. A. Dolby's *Prague Illustrated*, a fine folio volume printed by the Hanhart firm not earlier than 1860, is still in the old black-and-tint style of two decades before, although the tints display a greater range of colouring than was common in prints of that character. There may, however, have been some special reason for this book being so produced, as chromo-lithography of a fairly advanced type is seen in *A Booke of Christmas Carols*, illustrated by the Hanharts and published by Cundall in 1846. This is for several reasons a desirable little volume; the letterpress portion, which is within broad decorative borders lithographed in gold and colour, was printed at the Chiswick Press in old-style roman type; a few miniatures were reproduced in gold and colours from ancient MSS., that which forms the frontispiece being the best. Messrs. Hanhart did colour illustrations of a different order for the *Poetry of the Year* (Bell, 1853), which contains a charming series of twenty-two

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landscape views lithographed in colours by the Hanharts and by Day & Son, though the precise share of the two firms is not defined. In these cases, the prints were trimmed closely and mounted on the text pages, an unusual style, which gives an additional charm to the book. The same course was followed in *Feathered Favourites* (1854), in which the prints were circular, and mounted within floral borders printed in gold; there is no imprint on these pictures, so it cannot be stated by whom they were produced. Another variation from the usual practice occurs in Pyne's *Mountains and Lakes of Switzerland and Italy* (Bell & Daldy, 1871), in which the sixty-four chromo-lithographic illustrations, probably by the Hanharts, are printed directly on the text pages. During the fifties and later, the same firm produced a great number of chromo-lithographic title-pages for musical publications, a branch of colour work which even Baxter descended to. Many of these are very good, though, of course, not elaborate specimens of colour printing.

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CHAPTER VIII

CHROMO-LITHOGRAPHY

SECTION II

FROM THE EXHIBITION OF 1851 TO THE PRESENT DAY

HE Great Exhibition of 1851 formed a sort of general rendezvous for the lithographic colour printers of the day. Little was said by the Jurors about chromo-lithography, beyond the rather hackneyed statement that by impressions from successive stones results were obtained equal in effect to a good painting. The exhibitors included Engelmann and Graf, Dickes, Owen Jones and Noel Humphreys; the Hanharts had a stand with a good display of their chromo-lithographic productions, one of which, "The English Squire," by Brandard after Fred. Taylor, was shown in all its progressive stages. The Jury were so impressed with the novelty of the firm's chromo-lithographic process of colour-blending that they awarded it a medal, though they considered that the actual inventor of the method was Hullmandel, who had died the year before. Day died in 1845, but the business was continued by his three sons, who got out for Ackermann and other publishing houses, in 1851-2, a series of chromo-lithographic illustrations of the Exhibition, several of which (got ready even before the show opened) were of great size, 35¾ × 27 inches. Some beautiful work is seen in the series of plates this firm produced, depicting in the colours of the originals a large number of the fine art objects exhibited. A few good examples on a smaller scale may be seen in the plates of textile fabrics, etc., they prepared for the Exhibition catalogue. Perhaps the most remarkable pictorial record of this world-famous show was Dickinson's *Comprehensive Pictures of the Great Exhibition*, the views in

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which were lithographed from pictures in water-colour painted for the Prince Consort, to whom the work was dedicated, by Nash, Haghe and Roberts, and issued in two huge folios by Dickinson Brothers, publishers to the Queen, in 1854, three years having thus been occupied by the preparation of the volumes. Owing to the large size of the pictures, 19¼ × 14¾ inches, this is perhaps the most realistic series of prints of the Exhibition available in book form, but the colours were still applied to tinting drawings in black outline and stipple. A little hand-touching is visible here and there, but chiefly takes the form of small patches of varnish to deepen the shadows, a trick which was then common, and was the predecessor of the modern practice of varnishing the entire surface of a picture by a machine. There is more evidence of blending of tints than was often the case with large prints of this character, and the colouring is generally bright and good. An earlier example of Dickinson's chromo-lithographic work is *A Spanish Ladye's Love* (1846), a folio volume which has an illuminated title, and a number of full-page lithographs in black and white. The text is in the upper right-hand corner of each of these, in gothic letter, printed in red and blue, with ornamental initials in the style of the old MSS.

Two of the London music publishing firms, Jullien & Co. and Chappell & Co., had a good show of musical publications with title-page pictures printed in colours. Some of the first-named firm's were done by Baxter, the others being chromo-lithographed. At Hullmandel & Walton's stand were a couple of prints in colours by the former's patent "Lithotint" process, which was rarely used for colour work, although a really fine print of this character often challenged comparison with a mezzotint. Day & Son showed "Specimens of tinted and coloured lithography or chromo-lithography," and one Thomas Underwood, a Birmingham lithographic printer (the only provincial worker in that line who exhibited), had examples of "A new process of producing imitations of water-colour drawings and oil paintings," the novelty

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apparently consisting in their production by an improved lithographic press. Messrs. De la Rue & Co. were still operating their patented process of producing playing-cards in colours, and showed specimens, eight tints being often employed. They also produced box-tops and bands for piece goods, printed in gold and colours. J. R. Dicksee, a London lithographer, had a six-colour chromo-lithograph on view.

All these exhibits were produced on the hand-press, as no power lithographic machine had yet been placed on the market, although an impression roller had been adapted to the lithographic press by more than one inventor, notably by Dumontier, of Rouen, in 1844 and A. C. Waterlow (a member of the well-known London printing firm) in 1850. A German mechanic, Siegel, of Berlin, brought out a cylinder lithographic printing machine in 1852 (the actual impression was given by the aid of a " scraper "), which was introduced into England by the Scotch lithographic printing house of Maclure & Macdonald, and continued in use for some time, although gradually superseded by a machine invented by a Parisian named Engues, which was sponsored in England and the United States by Messrs. Hughes & Kimber, the printers' engineers. Many other inventions of the kind followed, all having for their object the improvement of the process of lithographic printing, both as regards speed of production and simplification of detail. Two Glasgow patentees, D. Tannahill (1854) and J. Wallace, proposed to construct machines adapted to print from zinc as well as from stone, the former's having two impression cylinders, to print two pictures at once, and from a reel of paper if required ; whilst the latter had a stone or zinc printing cylinder. A stone cylinder had, however, been patented as early as 1845 by Scholefield, a Manchester man, in combination with an impression cylinder, whilst as regards the modern use of zinc, the American Lithographic Company have built a number of multi-colour rotaries of late years, with zinc printing cylinders, *i.e.*, steel cylinders covered with electro-deposited zinc.

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The decorative art aspect of the Exhibition formed the subject of a fine publication by M. Digby Wyatt, who, like Owen Jones, was an architect. This was entitled *The Industrial Arts of the Nineteenth Century*, and was issued in forty parts, each containing four plates, between October, 1851, and March, 1853. The plates were chromo-lithographed by Day & Son, from the drawings of about a score of artists specially employed for the purpose. This work was said to be "the most important application of chromo-lithography, to assist the connection which should subsist between art and industry, which has yet appeared." Like nearly all the chromo-lithographs of this period, the outlines are printed in black, but the colour work is often of a very elaborate description, as many as fourteen stones being required for some of the pictures, though the average is seven. In all there were 1,069 stones, weighing some twenty-five tons, and as the edition consisted of 1,200 copies, no less than 1,300,000 separate impressions had to be taken from the stones, and when it is remembered that in those days the stone had to be cleaned and the paper adjusted after every one of them, the magnitude of the task will be realised. As examples of chromo-lithography, some of these pictures are particularly fine. Amongst them may be mentioned Plate 28, a cashmere scarf end; 41, a group of Church plate; 44, portières of printed mohair; 116, a chintz pattern; 148, an Axminster carpet; 152, a group of Indian objects; and 157, an ivory throne and footstool.

Everybody who made some slight improvement in machinery or methods forthwith advertised that he produced his prints by a "new lithographic process." Thomas McLean, the Haymarket publisher, used such a one for the illustration of his *Sketches and Notes of a Cruise in Scotch Waters* (1850), but whatever novelty there may have been in it, there is nothing to be gathered from the pictures themselves, which are of quite ordinary character. A really novel process, however, for that period, was operated by Messrs. Thomas

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NELSONS' COLOUR WORK

Nelson & Sons, the Edinburgh publishing firm, who had had leanings towards colour work for some years, but hitherto of purely letterpress character. Examples may be seen in *The Gift Book of Biography for Young Ladies* (1848), the text of which was printed in blue ink within red ornamental borders ; and on a more elaborate scale in *The Poetry of Home* (1849), a quarto volume in which the text, also in blue ink with occasional headings in red, was surrounded with double concentric borders in red and blue. Each of these books was provided with a chromo-lithographic frontispiece in gold and colours, by Schenck, of Edinburgh. It was about this time that G. J. Cox, of the Polytechnic Institution, London, invented a process of transferring steel and copperplate engravings to stone, guaranteeing them equal to a run of 3,000 impressions, not a great one, it must be admitted. Transfer lithography was practised by Silbermann, of Strasburg, ten years before, in connection with the production of his first "Album," and Nelsons began using it in the fifties for colour work. Specimens will be found in J. H. Balfour's *Plants of the Bible* (1857), in which the transferred steel-plate impressions, printed on stout coated paper, are lightly tinted from other stones. These plates are rather rudimentary, but similar work of a more advanced type appears in those of S. Moody's *Palm Tree* (1864), which are fairly good examples of colouring, though only three or four tints were employed. The process resembled that of Baxter in that the colours were applied to a steel-plate engraving, in fact, the Edinburgh firm termed their method "Printing in oil colours," but whereas Baxter used wood blocks for his tone work, Nelsons preferred stones. They used this process largely for the production of view and guide books, of which one of the earliest is that to Windsor and Eton (1859), and perhaps the best that of the Isle of Wight, with twenty-seven pretty little coloured pictures, printed, as usual, on a "dull" heavily-coated paper. The sky effects were generally "ruled," and are noticeable for their brilliant blues, which seem characteristic of this

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steel-cum-stone work by Nelsons. Besides books, they also produced great numbers of coloured picture cards, singly and in sets, such as *Songs by the Way* (1880). The appearance of the pictures in such works as the *Picture Primer Series*, where they are printed in colours on the text pages, suggests that woodcuts as well as steel engravings were often employed, and that the tinting was not always done from stone. Another Edinburgh publishing firm, Gall & Inglis, issued many books illustrated with pictures "printed in Baxter's oil colours" by Kronheim; indeed, the frequency with which the term "printed in oil colours" appears in connection with illustrated books published from the fifties to the eighties affords evidence of the popularity of Baxter's process. Among other London firms who used modified forms of it were Ben George, of Hatton Garden, as in the tinted woodcuts in *Peter Parley's Annuals* for 1869-70; and Read & Co. of Johnson's Court, Fleet Street. The latter published a series of *Old and New Testament Stories*, each containing four full-page woodcuts in black, coloured in particularly glaring tints from rather coarsely engraved blocks.

A noteworthy firm of French chromo-lithographers in the fifties, who exhibited at the great show of 1851, was that of Lemercier (afterwards Lemercier & Claye), Paris. One of their most important productions was an edition of A'Kempis' *Imitation of Christ*, published by Curmer in two imperial octavo volumes in 1856-7, the second of which consists chiefly of remarks upon the MSS. laid under contribution for the supply of the decorative detail on the pages of the first. This latter contains sixteen pages of tables, a Calendar extending to twelve pages, and 400 pages of text, with eight separate sectional titles. Every page is surrounded by a wealth of coloured ornament, to obtain which the great libraries of the Continent were ransacked, MSS. from the eighth to the seventeenth centuries being dealt with, although French ones of the fourteenth and fifteenth centuries furnished the bulk of the detail copied. There are several full-page

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miniatures, and the splendid colouring is heightened with gold throughout, some of the borders being printed on a gold or bronzed background. The actual text is restricted to a space of 12mo size on each page, and was also printed from stone. For this purpose, the matter was first set up in type, and proved on sheets of China paper, from which it was transferred to the stone. The colour work necessitated the use of 900 stones, most of the designs selected for reproduction requiring from three up to as many as fourteen tints, and great care had to be exercised during the progress of the work, in order to avoid any confusion of tones as a consequence of unequal drying of the sheets, due to variations in temperature. The work, it may be mentioned, was issued in sixty-four parts at 3.50 francs each. In 1861 Curmer published a fine chromo-lithographed reproduction of that famous illuminated mediæval MS., the *Livre d'Heures d'Anne de Bretagne*, and in 1864-6 *L'Œuvre de Jehan Fouequet, L'Heures de M. Estienne Chevalier.* This is a similar publication to the *Imitation*, and was issued under the patronage of the Pope, in thirty parts at six francs each. The lithographed colour plates are fully equal to those in the other work.

Simultaneously with the production of these splendid books in Paris, another, of even greater artistic importance, although not possessing the same degree of pictorial beauty, was being got out in London, viz.: Owen Jones's *Grammar of Ornament*, which maintains to this day its position as a standard work on the subject. Jones himself was then engaged in decorative work in connection with the Courts he designed at the Crystal Palace, and so the hundred and odd plates for the *Grammar* had to be entrusted to others. They were drawn on stone by Francis Bedford, with the assistance of four supernumeraries, and it is noteworthy that their execution occupied less than a year. How much work they entailed can be better gauged from an inspection of the great volume itself than from any mere verbal description. The world's varying schemes of ornament, ancient and modern, savage and civilised, historic

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and pre-historic, are all represented in minute detail. Commencing with the rude ornament of the untaught savage, the beautiful series of coloured plates in the *Grammar* conduct the artist viâ Egypt, Babylonia, Persia, Pompeii, Rome and Byzantium to the Arabic, Moorish, Turkish and Chinese styles of decoration. Then we have the ancient Celtic, the mediæval, and the Renaissance periods, the work closing with some modern designs of conventional stalk-and-leaf character. This truly monumental production was published in 1856, all the colour work it contains being executed by Day & Son, whose reputation, even had they never done anything else, it would most certainly have made. Needless to say, it was a very expensive work: the British Museum copy, in a fine appropriate binding, is recorded to have cost £19 12s.; a second edition, with some additional plates, was issued in 1865. Jones died in London nine years later, but his *Grammar* was reprinted as recently as 1904 by Messrs. Vincent Brooks, Day & Son, Ltd., who succeeded to the business of the old firm in 1867. In 1852, Day & Son published a chromo-lithographic reproduction, by Robert Carrick, of Turner's picture, "A Vessel Burning Blue Lights." Turner is not an easy artist to imitate, but Carrick acquitted himself well by producing an excellent rendering of the original. The print measures 27 × 21¼ inches, and was printed from twelve colour stones. It is one of the earliest examples of the modern type of lithographic colour work, in which the black outline of former days is altogether dispensed with, the picture being the product of the colours alone. In the same year Day & Son produced for John Wyatt Papworth a private plate representing, in the colours of the original, the "Ladies' Carpet" which had been presented to the Queen a short time before. Colour work of quite a different character is seen in the "Table of Wrought Iron" prepared for the Exhibition of 1851; it is a large folio sheet, divided by rule work, printed in green, into about 1,000 small oblong spaces, in each of which are several numerals in red or green in alternate colours. The whole is

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surrounded by a rather inappropriate border of holly, printed in red and green. The table work was probably first set in type, and proofs transferred to the stone. From the same period dates "The Star of Brunswick," a large circular design in the style of a Gothic wheel window, about two feet in diameter, each of the forty sections being divided by rule work into thirty-six smaller spaces, containing numerals in red and black. This was lithographed by Cartwright. One other contemporary production of this kind may be mentioned, though it was not lithographed, viz.: *The Newspaper and Parliamentary List*, published by the London firm of Dawson & Sons. This was also a large folio sheet, the lengthy list of periodical publications being printed from type in red, blue and black, denoting respectively the Liberal, Conservative or Neutral tendency of the political opinions of the journals enumerated.

Three-colour work from stone has been referred to already, and was long considered to rank among the possibilities that were doomed not to succeed, but it was tried again in 1856 by J. Aresti (who held the post of chromo-lithographer to the Queen), in a reproduction of a fresco by Michael Angelo, in the three primary colours, printed over each other in subdued tones. The tinting from stone, in red, yellow and blue, of lithographed designs in black, was being carried on even in unprogressive Egypt by 1855, at the establishment of Carlo Gottwa, an Italian who had settled in Alexandria, and "chromalithographyed" (*sic*), among other things, a series of pictures illustrating Egyptian Costumes. Early in the sixties, Day & Son, Ltd. (the firm was amongst the first to take advantage of the Companies' Act of 1861), got out several fine works by Jones, including a couple of pictorial volumes, *Joseph and His Brethren* (1865) and *Scenes from the Winter's Tale* (1866). These were in the flat-tint style of the earliest chromo-lithographic period, the pictures being printed against a solid gold background, and surrounded with a decorative border, which in the *Winter's Tale* was of

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an appropriate Greek key pattern, the text being on opposite pages in plain black lettering, also on a gold background with border. An edition of Tom Moore's *Paradise and the Peri*, a little earlier in point of date (1860), was illuminated in similar style. In 1864, Jones's *One Thousand and One Initial Letters* was published, this being a volume mainly intended for the use of the artist and designer. Though elaborate in detail, it was simple in colouring, red, blue and gold being the chief component tints. Simplicity in colouring, and to a large extent in decorative detail also, characterised the *Victoria Psalter* (so called owing to its being dedicated to the Queen), illuminated from Jones's designs, and published in 1861. This was a very large folio, the leaves, of stout board, measuring 15 × 12 inches, and each page of text was surrounded by an ornamental border. There was in addition a great number of initials in colours, which were subsequently pressed into the service of the *One Thousand and One* series just alluded to. The first few pages are finely decorated with a wealth of intricate leaf ornament, and the volume was enclosed in a special binding of brown leather, embossed in bold relief in imitation of oak carving. The colouring in the body of the work is not, however, nearly so elaborate as in some of the other books just mentioned. Day's got out a fine volume of colour printing in connection with the marriage of the Prince of Wales to Princess (now the Queen Mother) Alexandra in 1863.

A few years before Mr. Vincent Brooks, senior (who died in 1885), took over the lithographic business of Day & Son, he produced the plates for a handsomely illustrated volume of *Shakespeare's Songs and Sonnets* (Sampson Low & Co., 1862), which contains ten fine chromo-lithographs after designs by John Gilbert. These are excellent examples of lithography in blended tints, and reproduce perfectly the characteristic Gilbertian touch and colouring. One can gather from these beautiful prints that Mr. Brooks, who had been in the lithographic trade since 1848, was well qualified to carry on the artistic traditions of the older house of Day. The volume also contains

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thirty-two woodcuts, engraved by Edmund Evans and printed in brown ink, with letterpress matter below, on a grey ground, parts of which were engraved out where the woodcuts fell, so as to give something of a chiaroscuro effect. Mr. Brooks reproduced the well-known Chandos portrait of Shakespeare, and it may be mentioned that his firm has done the coloured cartoons for *Vanity Fair* from their start. Messrs. Waterlow & Sons, of London, were also doing fine chromo-lithographic work at this period, and some of the best of it appears in Dr. J. T. D. Descourtily's *History of the Birds of Brazil*, published at Rio Janeiro in 1852-6, and dedicated to Dom Pedro II ; the colouring of the plates is very brilliant.

Apart from Jones's illuminated books, Day & Son distinguished themselves by producing W. and G. Audsley's splendid rendering of *The Sermon on the Mount*. The Audsleys were Liverpool architects, who followed Jones in developing a taste for the internal polychromatic decoration of public and private buildings, and turned their decorative instincts to account in connection with the production of finely illustrated books. The volume under notice was chromo-lithographed from their designs by W. R. Tymms, and published in 1861 ; it has only twenty-seven leaves, printed on one side of rather thin and weak plate paper, the lithographed surface measuring about 16 × 14 inches. The style of ornament adopted is mainly based upon ancient MS. precedents, and some of the large initials and attached marginal ornament are remarkably fine, silver as well as gold being used to set off the colour decoration, the work as a whole being distinctly finer than anything Jones produced in the sixties. A reduced facsimile, on a scale of about a fourth of the original, was issued subsequently, and on this occasion the lithographed pages were cut close and mounted on stout cardboard leaves within red line borders, so that the colour work is seen to better advantage. In the same year the Audsleys published a *Guide to Illuminating* (as Jones had done a dozen years before), with some colour illustrations, and then we hear little more of them in

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connection with chromo-lithography for some twenty years. In 1882 they published a fine folio on *Polychromatic Decoration as applied to Buildings in the Mediæval Styles* (Sotheran & Co.), which contains thirty-six plates lithographed in gold and colours, and was accompanied by the same authors' *Ornamental Arts of Japan*, illustrated in similar fashion. This was followed the next year by what was described as a " popular " account of the art of printing pictures by the chromo-lithographic process, though one can scarcely imagine such an expensive work becoming popular in the ordinary sense of the term. The text was elucidated by forty-four plates in colour, but although some account of the rise and progress of lithography was given, there was not even an attempt at presenting a history of that branch of the art with which the book dealt! To treat the subject adequately would, it is true, require a volume of no mean dimensions, and a great deal of research, which facts have perhaps deterred the army of writers on lithographic subjects from venturing to tackle it. There is a good technical work on colour lithography in Wyman's Technical Series, viz.: Richmond's *Colour and Colour Printing as Applied to Lithography*. There is also one published in German by W. Knapp, of Halle (F. Hesse, *Der Chromo Lithographie*, 1904). From the general reader's point of view, the article on chromo-lithography in the *Strand Magazine* for January, 1904, should be of interest. The process has given its name to at least one periodical publication, *The Chromo Lithograph*, " a journal of art and decoration," started in 1867 and continued until 1869, which was published by Day & Son, but the colour prints that illustrated it were rather poor examples of the art. It incorporated an earlier periodical, *Nature and Art*, which ran for a few months in 1866-7, and also contained some chromo-lithographs. What was claimed to be the first British periodical produced by chromo-lithography was *The Little One's Own Coloured Picture Paper*, started by the London firm of Dean & Son in May, 1885. Subsequently it passed

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through various hands, and changed its title no less than four times, but still maintained something of its original character. In 1870-1 the *Youth's Pictorial Treasure*, a sixteen-page monthly, was issued at Birmingham by the late Mr. James Upton, a colour printer, each number containing four full-page coloured pictures, consisting of outline woodcuts tinted by successive colour impressions from smooth-surfaced relief blocks.

The most important non-commercial application of chromo-lithography, in this country at any rate, was made by the Arundel Society from 1856 to 1897. This Society was founded in 1849, under the auspices of Ruskin, Samuel Rogers, Lord Lansdowne and others, mainly for the purpose of illustrating, by reproductions of early Italian frescoes, the revival of the arts in the thirteenth century. The Society was named after Thomas Howard, Earl of Arundel, a great seventeenth century collector of objects of "bigotry and virtue." Its earliest prints were line engravings, but subsequently it was decided that the comparatively new art of chromo-lithography should be taken advantage of, and after a reproduction of a modern water-colour drawing had been made by way of trial, the long (and now valuable) series of 197 colour prints was commenced in 1856, by the production of a facsimile of Perugino's "Martyrdom of St. Sebastian," from the original at Panicalle. This was executed for the Society by Vincent Brooks, but is far from being one of the most prized of the series, copies being quoted at no more than 30s., as compared with ten times as much for some of the others, such as Bellini's "Madonna and Child." Having regard to these extravagant prices, the collector of Arundel chromos no doubt envies the members of the Society, who, for an annual subscription of a guinea, were entitled to a copy of each of its publications. From 1856 to 1865, fifty-two chromos were produced; in the succeeding ten years, seventy; from 1876 to 1885 there were only forty-three; and during the twelve years ended 1897, but thirty-one; the series coming to an end with the

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publication of D. Gozzali's "St. Augustine and Child." Notwithstanding the present demand for these beautiful colour prints, the Society was dissolved owing to sheer lack of public support. Photo-chromo-lithography not having been established when the Arundel prints began to appear, every picture chosen for reproduction had to be copied by an artist, under expert direction. Though an English firm was employed to produce the prints at the start, the Society at a later period favoured chromos "made in Germany," and the names of many well-known German lithographic firms may be found on the prints, including Storch & Kramer of Berlin, the lithographers of the colour plates for Prof. Grüner's fine work on the art objects in The Green Vaults at Dresden (Virtue, 1876); Wilhelm Greve, of Berlin; Hangard-Mange, etc. It is needless to attempt to describe the Arundel chromos in detail, as examples may be seen in almost every second-hand print dealer's window. Like other "collected" items of this character, some of them have recently been reproduced.

A passing allusion may be made to a German type of chromo-lithograph, known as the "oleograph" from the fact that the finished print was thickly coated with an oily varnish, and was passed, when dry, beneath a patterned roller, which imparted to the surface an embossed impression resembling the grain of canvas, or more rarely the texture of garments or the outline of jewellery, etc. The oleograph is usually despised as a cheap "made in Germany" sort of thing, but some of the larger prints are far from being bad, indeed they are occasionally really good examples of chromo-lithography.

The introduction of photo-lithography in the early fifties had practically no effect on colour printing. Probably one of the earliest works in which it was used for that purpose was the facsimile reproduction of Domesday Book, commenced about 1860. This is two-colour work, as the frequent rubricated headings and passages are reproduced in the colouring of the original. A negative of each page having been taken, a sheet of paper coated with gelatine and sensitized with

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bichromate of potash was exposed under it, the resultant print being then coated with photo transfer ink, and washed in order to remove the superfluous ink in the unexposed parts. A photo-transfer print being thus obtained, it was laid down on zinc, and after transfer the zinc plate was etched for printing in the usual way. This is the "photo-zincographic" process first used by the Ordnance Survey Department at Southampton.

In this connection, it will be of interest to recall a previous proposal to reproduce Domesday Book in the two colours of the original. This was in 1767, at the instance of the House of Lords. It was estimated that 1,164 copperplate facsimiles of the pages of the MS. would be required, and particulars as to the probable cost of the work were obtained, the suggested edition being intended to consist of 1,250 copies. The cost of tracing a page of the MS., and engraving it on a plate of copper, was taken as £4 4s., the plates themselves being priced at about 6s. 5d. each. It would have taken a man ten days to do a single plate; and to print 1,250 copies from the entire series, in one colour, would have cost £2,560, or in two colours, £7,280. In addition, 25s. per ream would have had to be paid for paper in the former case, but 30s. in the latter, in order to stand the extra handling and printing. It was estimated that the entire task would occupy five years, and that the total cost, if the sheets were printed in two colours, would be £18,443. Under these circumstances, it is not surprising that the Government decided it would be much cheaper to have a typographic reproduction, which was accordingly put in hand, although it was only printed in one colour, and thus looks rather crude by the side of the modern reproduction. A very different and much more realistic result than either of these could be achieved if the work were again reproduced, by one of the latest processes, such as collotypy, and the time and cost would be very much less. Photo-lithography is now generally used for work of this character, as the camera does in a moment what a draughtsman or copyist would need perhaps a day to do.

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The adaptation of photography to chromo-lithography was perhaps first proposed by Mr. Burnett, a member of the Edinburgh Photographic Society, in a paper read before that body in February, 1857. He suggested that as many negatives should be taken as it was intended to use colours in the picture, and that those parts of each which it was not intended to print in a particular colour should be stopped-out, when the remainder of the image could be printed through the negative on to a stone covered with a solution of asphaltum in ether, a method of photo-lithography which had been patented in 1852. In the *Art Journal* for August, 1854, there was an article dealing with a new process of photography on wood, with a specimen cut that had been produced by its aid. Mr. Burnett went further, and suggested that the series of negatives just alluded to could be printed on as many sensitized wood blocks, which could then be engraved for printing in colours in the usual way. This is an idea that we do not think has ever been carried into practice, but the asphalt method of photo-chromo-lithography has since been perfected under the name of Photochromy. This process, in its modern form, was invented at Zurich about 1887, under the auspices of Messrs. Orell, Fussli & Co., a prominent art printing and publishing firm in that city, and was introduced into England by them shortly afterwards, though it was not until 1896 that the present Photochrom Co. was formed. Since the original patents expired, many other firms, British and foreign, have adopted the process, and some very fine work is turned out by it. As the name implies, a "Photochrom" is, in spirit if not in fact, a colour photograph, the base being generally a collotype print, either produced direct from the film or through the medium of a transfer on to stone. As regards the colouring, it is as near nature as one can reasonably expect to get, short of actual colour-photography, seeing that every part of the colour detail is applied from what is, to all intents and purposes, an integral portion of the image on the negative, transferred to stone by ordinary

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photo-lithographic methods, the glossy film applied to the finished print serving to heighten the impression of being a photograph in colours. Some Continental firms use as many as sixteen colours in their photochroms, but the average number falls very much below this. As a photochrom is not a half-tone colour print, the three-colour process does not, or at any rate need not, enter into its production. Tri-chromatic photo-lithography is, however, more than a quarter of a century old ; as early as 1883 Mr. W. Griggs, of Peckham, was working on these lines, and a specimen print of this kind by him will be found in Hodson's *Guide to Art Illustration* (1884). This process has often been used for the reproduction, with only three printings, of multi-colour pictures by another method. The late Mr. Ernest Nister, the Nuremberg art publisher, patented a process of this sort in 1895, and an example of its results, a three-colour photo-lithographic reproduction of a fourteen-colour chromo-lithograph, appears in one of the parts of Fritz's *Handbuch für Lithographie und Steindruck* (Halle, 1897-1900). This was printed, not from stone, or even from zinc, but from aluminium, which was first used as a printing medium about 1889, in both Germany and America, and is now to a large extent superseding zinc, just as the latter had in some degree taken the place of stone in lithographic printing processes. The introduction of this light and ductile material, in place of the heavy and cumbrous stones, has almost revolutionised the lithographic printing business, as the aluminium plates can be bent round a cylinder, and the sheets thus printed by rotary press methods, the production of lithographic work in colours being thereby greatly accelerated and simplified. Still more recently, the rotary principle has been applied to chromo-lithography along the lines on which, for nearly twenty years previously, printing on tin had generally been conducted, *i.e.*, the impression from the printing surface is not made direct on the material to be printed, but on an intermediate flexible surface, such as india-rubber, from which the still wet impression is transferred

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or "set-off" on to the paper. But this is so essentially modern a method that it must be left for Mr. Gamble to deal with.

Some of the best modern examples of photo-chromo-lithography are to be seen in the books Messrs. Griggs & Sons have illustrated for the Trustees of the British Museum. The *Facsimiles from Early Printed Books in the British Museum* (1897), some of which required four stones, were produced in this way by Mr. Griggs, whose firm has for many years taken a leading part amongst those operating this method. Still finer work of this description will be seen in George F. Warner's *Illuminated MSS. in the British Museum* (1899-1903). The four series contain in all sixty plates, the facsimiles being printed in colours on a ground tinted to represent the tone of the old vellum. Where gold occurs in the original it is, of course, reproduced, although it was found practically impossible to burnish to the exact degree desired. 300 copies of the first series were run off, and the stones then cleaned, but as the demand justified editions of 500 in the case of the other series, the work was done again for the first lot, so as to enable a further 200 to be printed. The coloured illustrations of some of the bookbindings in the Corfield collection, which appeared in Messrs. Sotheby's catalogue of that sale a few years since, illustrated the utility of photo-chromo-lithography as applied to the reproduction of book-covers. A French printer, M. Danel, of Lille, reproduced bookbindings in colours by typographical methods some twenty years since in somewhat similar style.

On the Continent, chromo-lithography is largely used for the purpose of colouring illustrations produced by a different process, such as half-tone or photogravure. The result of the former method is usually known as "Autochrom," and only differs from "Photochrom" in that it has a half-tone key-block. It dates from about 1900, and is best suited to the reproduction of ordinary negatives or silver prints, thus avoiding the use of orthochromatic negatives. The half-tone grain is usually routed out of those parts of the block that

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represent the high lights, and the colours supplied to the black impression from stone in the usual way. It is claimed that a result can be obtained with six or eight tints, by this method, as good as one that would require from a dozen to eighteen stones in ordinary chromo-lithography. The process is very much in favour for picture postcard work, more than one half-tone block being sometimes used. Fritz's *Handbuch für Chromo-Lithographie* contains an eight-colour print in the manner of chalk work, executed at the State Printing Office in Vienna, in which three of the colours (brown, grey and blue) were printed from half-tone blocks, and the rest—red, yellow, rose, with another grey and blue—from stones. Another good example of multi-colour half-tone work, having five tints—the three primaries and black, with the addition of pink—can be seen in the same volume, this being produced by the " Chromotype " process of that well-known Viennese house, Angerer & Göschl. In Hoffmann's *Systematische Farbenlehre* (Zwickau, 1892) is another five-colour print, an early specimen of half-tone, executed by Meisenbach, Riffarth & Co., of Munich. The grains in this case are rather coarse and irregular, as was then frequently the case. During the past year or two, a tendency has shown itself to follow the example set a score of years since in Paris, to colour half-tone pictures by means of grained blocks. A Boston (U.S.A.) firm, Tolsom & Sunergren, patented a process of this kind in November, 1903, to which they give the name of " Multitone." The colour plates are coarsely and irregularly grained or stippled, the pictorial effect being gained by a final over-printing from an ordinary half-tone block. Another method practised in America (by the Lakeside Press of Chicago, for example) exactly reverses this procedure, the half-tone block being printed first, in ordinary or double-tone inks, and the colours put on in transparent tints after the first impression has dried. The tone plates are of zinc, transfers from the original being made, and only the portions required for each colour retained, the rest being routed out. Both in America and on the Continent,

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though much more rarely in this country, a "woodcut effect" is frequently given to half-tone work in colours by tooling the plates over by hand. When this is carefully done, with due regard to the nature of the picture and the colour scheme, a very good effect is produced. A rarer class of work is that in which woodcuts are printed over half-tone coloured grounds. Excellent examples of this sort of thing can be seen in the Italian fashion journal, *Margherita*, in which the grounds are frequently tri-colour, the woodcuts (or line zincos from pen and ink drawings) being printed in black upon them with excellent result. Ordinary monotint photogravures are occasionally coloured by lithography on the Continent, this method being operated by the Imperial Printing Office at Vienna. A reproduction by that establishment of a picture by Rubens can be seen in Fritz's *Handbuch für Lithographie*; in this case a dozen colour stones had to be used, although the application of a single bright colour, such as red, will often produce a good effect. All sorts of more or less descriptive fancy names, such as Collotrichrome, Autobunt, Photo-lila, Nikipolychrom, etc., are given to these combination colour processes by the various Continental printers or publishers who operate them, but practically all of them have a photo-lithographic basis. "Photostone" is an English method, analogous to Photochrom, and another home-made term was "three-colour ink-photo," an adaptation of multi-colour work to the particular photo-lithographic method that has been for many years used in the production of the plates for the *Builder*. So-called new processes have, in fact, flitted across the colour printing firmament by dozens during the past twenty years, most of them having only a very ephemeral existence. Speed and cheapness of production are what the British publisher mainly requires where colour plates are concerned, and these points conceded, he seems to care for hardly anything else, so that those methods, such as colour-collotype, that really give the most artistic results, are thrust in the background, and seem likely to stay there

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until they can be worked on more economical lines than at present.

In 1898, Mr. G. R. Hildyard, a London colour printer, introduced the "Wharf-litho" process, which was a combination of lithographic and letterpress printing methods. The design drawn on the stone was transferred to as many zinc plates as there were to be colours in the finished print, and these plates were subjected to a certain chemical treatment, which enabled them to be printed—litho fashion—from the surface, on an ordinary Wharfedale machine. In 1899 a company was formed to operate the process, under the auspices of Mr. Harvey Dalziel, but although much good work was done, the concern was wound up in 1904. The "Chromo Spray Poster" was another of Mr. Hildyard's inventions, and met with the same fate.

As a method of book illustration, ordinary chromo-lithography is rather in the shade just now, except in France. A good and unusual example is afforded by an edition of Guy de Maupassant's *Le Vagabond*, published at Paris in 1902 for the Société des amis des Livres. The illustrations, which are somewhat of the impressionist type, were drawn direct on the stones by Steinlen, and are printed on the text pages. C. de Laclos' *Les Liasons Dangereuses* (Paris, Ferrand) has twenty-two chromo lithographs by Lubin de Beauvais, printed on buff-tinted paper, in the style of the eighteenth century imitations of drawings in coloured crayons. *Les Aventures du Roi Parisole* (Paris, Blaizot, 1906) contains eighty-two lithographsin tints by Pierre Vidal, who also designed coloured borders for each picture, and the fine series of initials in colours that decorate the pages of that handsome volume. This is an unusual type of chromo-lithography, resembling wood block work in colours, and all the pictures are on the text pages. Books of this character are, however, issued only to subscribers, in limited editions at very high prices, 200 francs being usually the cost of a copy on ordinary paper, *i.e.*, in the cheapest form. In this country such conditions would amount to absolute prohibition, except in a very few special cases.

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CHAPTER IX

PHOTO-MECHANICAL COLOUR PRINTING—COLOUR ETCHING

A CENTURY and a quarter ago, Tom Wedgwood, whom Mr. R. B. Litchfield terms "the first photographer," was experimenting with a camera obscura, but neither he or Davy, who followed him, were able to fix the images they obtained. J. N. Niepce of Châlons, some thirty years later, did however produce prints by the aid of light, although his was rather a printing-out method than what we now term photography, as his tin plates, coated with bituminous varnish, were exposed under the engravings he copied, the soluble part of the coating being afterwards removed, so that the plate could be etched for printing purposes. He was thus the first photo-engraver, though he did little more than a few trial plates. This was an intaglio photo-etching process, and so, for many years, were those that followed it, such as the methods of Claudet, the British exploiter of the Daguerreotype process (1843), and of Fox-Talbot, the father of British photography (1852-8). The latter was the first to utilise photographically what photo-engravers now term a "screen," for breaking up the half-tones into minute points to form a practicable printing surface, although he only used a piece of gauze for this purpose. The effect produced by "two sets of lines at right angles diagonally across the plate, leaving a surface of mere dots," must, however, be credited to Godfrey Woone, of Kensington (1846). Specimens of Fox-Talbot's later photo-engraving process, "Photoglyphy," may be seen in the *Photographic News* for 1858, but although he produced experimental plates

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at intervals for several years afterwards, no commercial use was made of the process.

The man who first placed photo-mechanical prints on the market for public sale was Paul Pretsch, of Vienna. In 1853 he invented a method of producing intaglio printing surfaces by exposing a metal plate, coated with bichromated gelatine, under a glass negative, and washing it in cold water afterwards, when the gelatine produced a grain in proportion to the action of the light, and formed a mould from which, when dried and hardened, a cast or electrotype could be taken. Pretsch came to England in 1854 to operate his process and formed a Photo-galvanographic Company, with works at Holloway, where a series of fine plates, denominated "Photographic Art Treasures," was produced in 1857. Some, such as "The Cornfield," from a photo by H. White, were based on negatives from nature, whilst others, like Sidney Cooper's "Cattle," were from photographs of pictures. The grain of the plates resembles that of collotype. This process is singled out for special mention, not only because it was the first of its kind to be operated on a commercial scale, but because it also furnished the first example of the application of press colouring to photo-mechanical prints. Two London lithographers, Lewis & Böhm, introduced, early in 1857, a method of colouring these photogravures of Pretsch's, from either wood, metal, or stone printing surfaces. The idea was not thought worth patenting, nor has the writer seen any colour prints so produced, but we have here a process almost identical in purpose with the "Photochrom" one of forty years later. Baxter, and some others, proposed colouring ordinary silver prints by lithography, but this is not the same thing. Pretsch's enterprise was not a success and he returned to Vienna in 1863. It is to another Viennese, Karl Klic, that the present half-tone photogravure method is due, he having simplified, in 1879, the old Photoglyphic process of Fox-Talbot's, so as to adapt it to modern requirements, but until quite recently no machine-coloured photogravures

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have been produced, the mechanical difficulties involved having proved almost unsurmountable. But the old process of inking intaglio-engraved plates by hand, in order to produce a coloured print at one impression, was revived about thirty years ago, and has been practised ever since. The Parisian publishing firm of "Goupil & Co." (Manzi, Joyant & Co.), was turning out colour photogravures from their printing establishment at Asniéres as early as the seventies, they having at that time a special photogravure process of their own, which was based on one invented by Woodbury, the originator of the "Woodburytype" method of mechanically producing imitation photographs. Like that of the Rembrandt Intaglio Printing Co., Messrs. Goupil's process is not a patented one, and thus the details are not public property. Photogravure is the method now generally employed for high-class reproductions of old engravings in colour, or of oil paintings, etc., the plate being inked by hand, from a standard coloured copy which the inker has beside him for reference. As the colouring is entirely at the discretion of the artist, and not dependent upon colour selection by the camera, the scheme can of course be modified or extended, according to the nature of the work and the price the producer of the plates is going to get for them. Only two or three firms in this country make a speciality of this class of colour printing, and these mostly confine themselves to the issue of plates for sale through the printsellers. Production is naturally slow, from six to eighteen copies a day, varying with the size of the picture and the number of colours used. In 1903 Messrs. George Newnes, Ltd., started a quarterly publication fitly entitled *The Ideal Magazine*, in which the illustrations were mostly colour-printed photogravures, produced at Willesden by the Art Photogravure Co., but its large size and almost prohibitive price militated against it, so that the first number was also the last. The Art Photogravure Co. were the successors in business of Mr. L. Collardon, who had been associated with Karl Klic. The Company, in its turn, has been succeeded

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by Messrs. Rich & Hart, formerly in its employ, and they still make a speciality of colour photogravure.

On the Continent many firms habitually turn out these photogravures in colour. A few works of the *de luxe* order have been illustrated in this manner by Messrs. Goupil & Co., such as Perrault's *Barbe Bleu* and *La Belle au Bois Dormant* (Boussod, Valadon & Co., 1887), with colour-photogravure reproductions of forty-one water-colour drawings by E. de Beaumont, printed on the text pages before the letterpress, which also appears to be engraved; this was got out at the firm's works at Asniéres. Benedite's *Musée du Luxembourg* (Paris, 1895) has a three-colour photogravure on the first page of the text. Molinier's *Le Mobilier Royale Française* (Paris, 1902) and the frontispiece to Sir John Skelton's *Charles I* (1898) are other fine examples of this firm's colour photogravure, and so is the frontispiece to Mr. Pollard's *Henry VIII* in the same series of monographs, though of a rather different order. There is at least one Paris firm producing multi-coloured photogravure prints from successive colour plates. Splendid work in colour photogravure is done by Messrs. Blechinger & Leykauf, of Vienna; whilst in London the Art Reproduction Co. have for many years had a special department for this class of work. Within the last year or so, the Rembrandt Co., of Lancaster, and the Van Dyck Gravure Co., of New York, have simultaneously perfected methods of printing photogravures in colours from separate plates on a rotary press, at a speed of several thousands per hour. This is one of the most important and interesting modern processes of high-class colour printing, and is perhaps destined to take —to some extent—the place of ordinary three-colour, to which, as a matter of results, it is much superior. The Rembrandt Co., in particular, have recently issued several exceptionally fine prints in colours, of a character quite different from any others now on the market, the flat mechanical effects of the trichromatic process being altogether absent. A reproduction, on a reduced scale, of one of them, appears in this

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volume. This Company's method has not been patented, and therefore nothing definite can be said about it here, although the mechanical theory underlying all processes of this nature will receive attention in Mr. Gamble's chapter.

One of the most recent series of prints in multi-colour photogravure, from plates inked *à la poupée*, is that of the facsimile reproductions of pictures by the late G. F. Watts, R.A., in the Watts Art Gallery at Compton, near Guildford, and elsewhere. These are printed (and the plates were prepared) by Mr. Emery Walker, and are very good specimens of this class of picture.

A quite different class of work, though meritorious in its way, was the aptly-named "Bartolozzi" series of miniature reproductions—about carte-de-visite size—of eighteenth century colour prints, that were brought out a few years ago by Messrs. E. W. Savory, Ltd., of Bristol, for use as private Christmas or other greeting cards. These were photogravures inked in three or four tints by stencils, and printed by the London firm of Allen & Co., Ltd. The colour scheme of the original could not, of course, be fully reproduced, but on the whole these little prints were very well done, and reflected considerable credit on those concerned.

A process for machine printing from intaglio plates in colours was patented by Neale, a Cincinnati printer, as far back as 1853. The plates were placed upon a series of beds upon endless chains, and the impression given by rollers. When a number of colours was required, they were applied to the plate by stencils, the surface being subsequently wiped automatically. Messrs. Danesi, of Rome, in preference to colouring photogravures with full body tints, employ only faint shades, a mere tinge in fact. After engraving the plate by the ordinary process, the copper is reinforced by biting in on all the parts which, conformably with a rough sketch previously made, are to be printed in colours. This reinforcing has to be executed with judgment by a skilled colour engraver, who then inks the plate, cleaning it so that the

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THE CONFERENCE

By Max Gaisser.

By the courtesy of the Storey Institute.

Printed by the Rembrandt Intaglio Printing Co Ltd

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parts to be coloured remain as distinct as possible. For colouring the plate in the proper parts, little pads or hair pencils are employed, and after doing so blotting paper is placed on the plate to take off the excess of colour. Then the plate is carefully cleaned to prevent all mixing, after which the printing is executed. Having pulled some proofs, a printer, if intelligent, will soon acquire such skill in printing and colouring that he will find it possible to produce in this way 150 copies per day, or nearly twenty times the output of the ordinary method. A specimen print of this kind appeared in the Journal of the Italian Photographic Society for September, 1904.

We have now to deal with those processes of colour printing in which a photographic image is used, either as an actual printing surface, as in collotype, as an etching ground, as in half-tone, or—in the form of a line block—as an outline for a picture that can be coloured by non-photographic methods. Prints of this latter character, *i.e.*, coloured line engravings, are not based on any scientific colour theory, but the collotype and the half-tone methods are generally operated, so far as colour work is concerned, on the lines of what is known as the three-colour process, *i.e.*, the so-called primary colours, red, yellow and blue, are successively printed from three separate blocks, and by their superimposition reproduce —assuming the inks, the blocks, the printers and other necessary adjuncts are right—all the colour values of the original. Collotype may be treated first, as being, so far as three-colour work is concerned, rather the older of the two. It is dealt with again in the next chapter, but simply described, collotype is the art of printing from a bichromated gelatine film, which, after having been exposed under a negative, acquires the property of absorbing water in exact accord with, but in inverse ratio to, the action of light. When the image has thus been formed, a roller charged with lithographic ink is passed over it, and the ink is taken up by the film in proportion to the action of the light. Thus the film has much the same properties as a lithographic stone. As early as 1855, Poitevin

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introduced a photo-lithographic process which contained the germ of the collotype method, but the invention of collotype proper is attributed to MM. Tessie du Mothay and Marechal, of Metz, about 1865, though they used a metal support for their films. Herr Josef Albert, of Munich (father of Dr. E. Albert, of the well-known process-engraving firm in that city), first introduced in 1869 the glass plate which is now mostly used as a base for the gelatine film. Albert turned the process to account for the production of collotypes in colours by the " Albertype " method in 1870, although he was closely followed, if not indeed preceded, by Husnik, of Prague, and Löwy, of Vienna, names still familiar in the colour printing world. Professor Leon Vidal was another early worker in this field, and the State Paper Office at St. Petersburg was producing colour collotypes by 1878, if not before. Prints of this kind are mostly on the three-colour principle, but this is not, of course, a *sine quâ non*. Obernetter, of Munich, worked a collotype process in the early seventies, in which any number of colours could be used, taking one negative for each colour required, and retouching and stopping-out before preparing the printing films. About the same time, a German scientist, Dr. H. W. Vogel, introduced colour-sensitive photographic plates, using napthol blue for the red, eosin for the yellow and fluorescin for the blue; the films thus prepared were printed in colours corresponding to that part of the spectrum to which the particular plate was sensitive. Much importance was attached to this invention in Germany; in the eighties a Society for Printing Collotypes in Natural Colours by Vogel's process was formed, and a number of prints produced, specimens of which were shown at the Berlin Amateur Exhibition of 1890, and the German Exhibition held in London in 1891, at which latter they were awarded a prize. They are very good examples of a somewhat unusual form of photochromic printing, and in general appearance rather resemble the new machine-printed photogravures in colour, having the same soft and silky aspect.

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COLLOTYPE IN COLOURS

Four-colour collotype, *i.e.*, the three primaries and a key plate in grey, was practised by a Munich firm, Messrs. Bohrer, Gorter & Co., for a few years from 1888, and some fine work was produced, but the demand was not sufficient to warrant its continuance. The same fate overtook the first attempts to popularise colour-collotype in this country, by Messrs. Waterlow & Sons, Ltd., in London (1891), the Photochromatic Printing Co., at Belfast (1894), and their successors the Heliochrome Co., in London, which ceased work in 1898. Both the latter concerns were under the practical management of Mr. Martin Cohn. Amongst the first-fruits of British colour collotype are the prints produced by Waterlow's for *Land and Water* in 1890-1. In the issue of that periodical for July 26th, 1890, reference was made to a picture intended to have been included in that number (but postponed to the succeeding one), which was said to be produced by a new process—a modification of colour photography—discovered by the editor. This print, a yachting scene, entitled " Rain and Sunshine on the Solent," was published with the issue for August 2nd, and though simple in colouring, is, if anything, a better example of the process than a couple which followed a few months later. These were portraits of their Royal Highnesses the Prince and Princess of Wales, the former being issued with *Land and Water* for March 21st, and the latter on June 20th, 1891; accompanying the first was an article on the subject by the gentleman responsible for the colour negatives, Mr. G. T. Teasdale-Buckell, in which he gave some account of the methods adopted for the production of the prints. *The Chase* for March, 1891, also contained a three-colour collotype print, representing a couple of vases, produced by Waterlow & Sons from colour negatives by Mr. Teasdale-Buckell; this was a rather better picture than either of the portraits. In 1900, Mr. Wetherman, of Enfield, started to produce collotype prints by the ordinary three-colour method, and Messrs. Valentine, of Dundee, even brought out some colour-collotype picture postcards a year or so

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after, but both these firms now find that this is not a process which can at present be carried on with a profit in this country, though Griggs & Sons, of London, and Bemrose & Sons, of Derby, have done some fine work by it. On the Continent, however, it is very much alive, as the numerous fine specimens which were shown at the Dresden Photographic Exhibition last year sufficiently demonstrated. Several of the text books on photochromic printing processes contain examples of collotype in colours. In Bonachini's work on Colour Photography (Milan, 1897) is a reproduction of an oleograph by the three-colour method, the separate colour impressions being also shown. August Albert's *Lichtdruck* (Halle, 1898) has a set of prints illustrating the four-colour method in its various progressive stages. Paul & Lehmann's *Hülfsbuch* (Breslau, 1890) has a six-colour collotype facsimile of a water-colour drawing of a gazelle's head.

The results of a process of colour-collotypy are well displayed in the fine series of reproductions of the works of some of the Old Italian Masters, commenced by the Medici Society, London, in 1898, and lately extended to some pictures of the Flemish, Dutch and English schools. These prints have a distinctive character of their own, recalling Dr. Vogel's process, and the series, which now includes some two hundred subjects, may be considered as worthily carrying on the work of the defunct Arundel Society. Within the last few months the Medici Society have commenced to issue, through their publisher (Mr. P. L. Warner), some books illustrated in colour by the process, amongst which may be mentioned *The Song of Songs* and the *Meditations of Marcus Aurelius*, both of which have colour-collotype reproductions of water-colour drawings by W. Russell Flint. These are works of the *de luxe* order, printed from a specially-designed fount of type on specially-made paper, and being illustrated in colour by a novel method, they constitute a distinct departure in art publishing. Signor Giulio Danesi, of Rome, a member of a family of untiring investigators of photo-mechanical printing methods, has

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SPECIMEN THREE-COLOUR COLLOTYPE.

PRINTED BY W. & T. GAINES, LEEDS

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lately hit upon the idea of using an aluminium plate as a support for the collotype film, instead of the usual glass slab. As the plate can be bent round the cylinder of a rotary printing machine, Signor Danesi has brought out a special press adapted for the purpose, on which he has been recently producing some fine three-colour collotypes. It is a point worth mentioning here that the firm of Danesi was perhaps the first to commence the publication of coloured picture postcards; this was in 1882, the designs being furnished by a Sicilian artist named Baldassore. Although the price was only ten centesimi (1d.) per card, there was practically no demand for them, and so the enterprise was soon abandoned.

Printing from several successive collotype colour films is rather difficult, the gelatine being so sensitive to changes of temperature, the effect of which is the distortion of the images, the alteration of the tones, and the consequent spoiling of the picture. The results of the process, when worked under satisfactory conditions from really good negatives, and with suitable inks, is however well worth the trouble that has to be bestowed upon the production of prints of this type, which, in the writer's opinion at least, are unexcelled by those due to any other photochromic printing process, save perhaps the new machine-printed colour photogravures. This is largely due to the absence of the hard mechanical grain of the half-tone print; there is of course a "grain" in collotype, but it is due, not to the interposition of a ruled screen, but to the puckering up of the surface of the gelatine film in drying, and is therefore very irregular, the unvarying patterned grains of the screen being thus absent. At the present day, collotype is very largely used in colour printing as a basic process, *i.e.*, a photographic representation of the original view, or picture, or object, is obtained by means of a monotint impression in collotype, the colouring being added afterwards by some different method, such as lithography, or printing from half-tone or other grained blocks. These combination processes have been mentioned already, and as Mr. Gamble will deal

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further with this branch of the subject in his chapter on modern methods of colour printing, the writer will pass on to the three-colour half-tone process, which is unquestionably the most popular method of colour illustration.

In principle it is based upon the idea that Newton promulgated, and which Le Blon, as we have seen, was the first to put into practice in connection with colour reproduction, viz., that there are but three colour sensations in nature. In its scientific modern form, on which practically all methods of colour photography are founded, this theory was first demonstrated about half-a-century ago, by Professor J. Clark Maxwell, who used coloured liquid filters for the purpose of obtaining three separate images of an object, representing those parts of it from which red, yellow and blue light were respectively reflected. The Professor also introduced that makeshift style of so-called colour photography which consists of viewing a set of three coloured negatives or transparencies through an optical instrument, in order to reproduce the colours of the original. The application of these colour negatives to the making of relief blocks for printing purposes dates from the sixties. Curiously enough, two independent French investigators, working along the same lines, originated trichromatic colour printing processes which were almost identical; they were Louis A. Ducos du Hauron and Charles Cros. The former published some details of his methods in *Les Mondes* and formally communicated particulars of the invention to the Academy of Sciences at Paris in December, 1867, whilst M. Cros patented his process in France in November, 1868, and rather tardily announced the discovery to the French Photographic Society in July, 1869, two months after a similar course had been taken by M. du Hauron with regard to his process, in the working out of which he was helped by his brother Alcide. They used orange, green and violet colour filters, but had no ruled screens; the printing method they proposed to utilise was lithography, the images obtained on the colour negatives being transferred to stone by the ordinary

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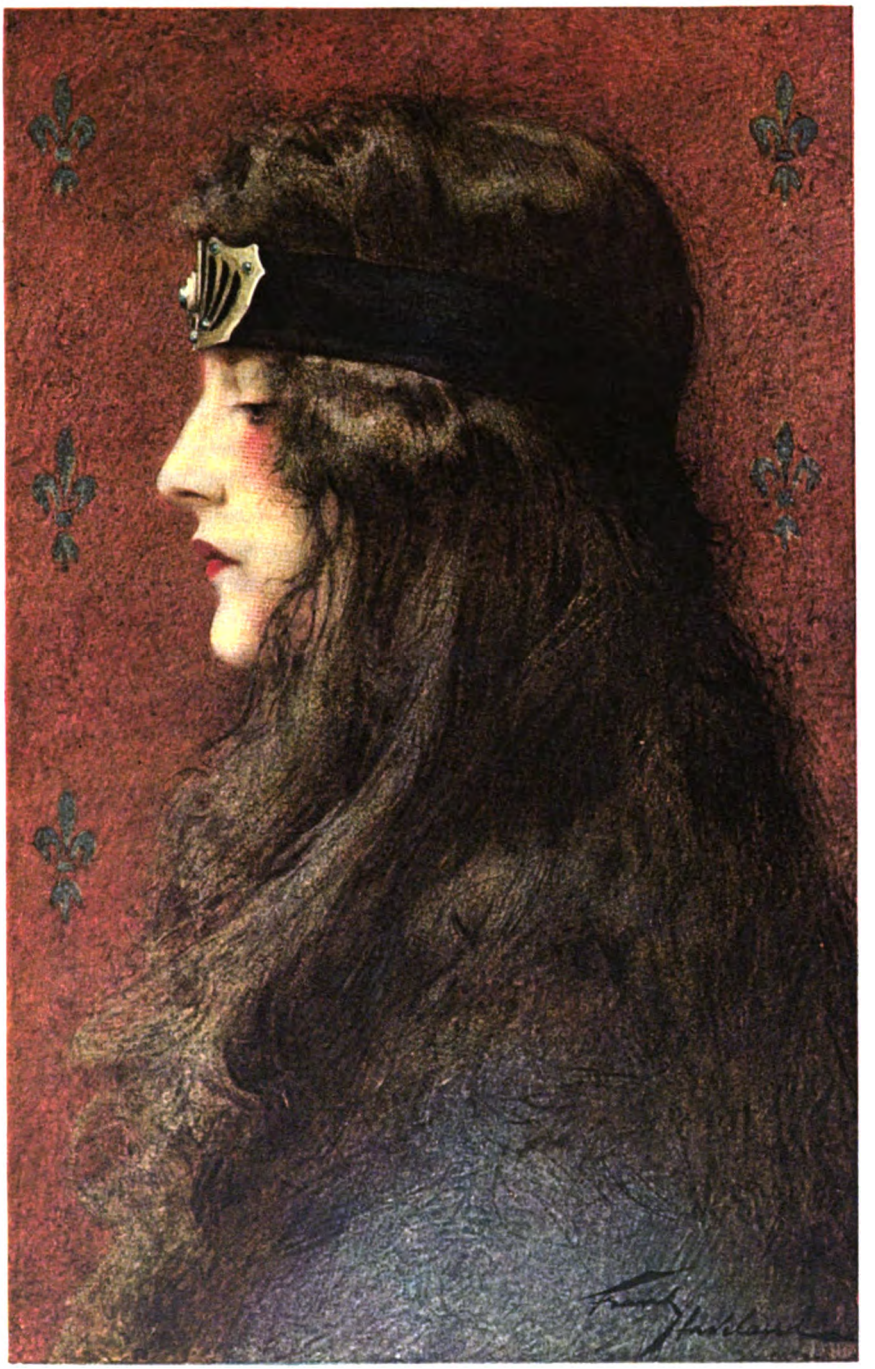

THE LADY HILDEGARDE

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photo-lithographic process, and printed in the three primary colours they represented. But three-colour photo-lithography has hardly ever proved a satisfactory method of colour reproduction, and Du Hauron's experiments proved no exception to the rule. Their process will be found described in the *Traite Pratique de Photographie des Couleurs* (Paris, 1878), and specimens of their three-colour prints may be seen in the *Cours de Reproductions Industrielles* (Paris, 1882). The latter work also contains an account—with an example—of Professor Leon Vidal's method of photo-lithographic transfer, for the purpose of colour printing from stone, which was not, however, based upon the three-colour theory, the outlines of the picture being given by printing a "Woodburytype" imitation photograph on the top of the set of colour impressions.

The trichromatic printing process depends upon the correct interpretation of the colour values of the object photographed, and this is accomplished by means of the "light filters" already referred to, glass cells of liquid colour or pieces of optically worked glass. It is theoretically assumed that there are but three colours to be rendered, red, blue and yellow, and hence it follows that in order to extract any one of these from the light reflected from the object on to the sensitive plate in the camera, the other two must be eliminated, therefore the eliminating medium—*i.e.*, the filter—must be capable of absorbing them and allowing the third colour to pass through. Thus an orange filter absorbs the red and the yellow—which produce orange—and allows the blue to pass, and so on with the others. The principle was first utilised, practically and commercially, in the seventies, in connection with the development of collotype, as has been stated already, its application to letterpress printing dating only from 1885. This is due to an American, Frederick E. Ives, of Philadelphia, to whom the credit of many other important inventions in connection with photo-mechanical processes must also be given, though the amount of profit he personally derived from them does not seem to have been very great. He re-invented the

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method, as old, photographically speaking, as Fox-Talbot's time, of breaking up the half-tones of a photograph into dots, so as to translate the picture into a relief printing surface that could be inked in the ordinary way. In 1878, when he was using the Woodburytype process for the production of letterpress printing blocks, he was in the habit of inking the swelled gelatine relief produced by that method, and pressing it on a sheet of paper with its surface embossed with a sort of grain in dots, that took the ink from the relief, and thus presented the picture in grained form, which Ives re-photographed, and made a zinc " process " block from, in the usual way. Examples of this method appear in the *Photographic News* for August 11th, 1882, and some of the numbers of the New York *Century Magazine* for the same year. Ives perfected the process later by taking a plaster cast of the Woodbury relief and applying to it a sheet of rubber with pyramidal dots all over its surface. These dots being inked, spread out more or less according to the varying relief of the cast, and thus left a sort of half-tone print on the latter, which was then photographed as if it were a line original, and a zinc block made in the usual way. For some time before this, Ives had been experimenting with colour photography, and had invented an instrument called a " Chromoscope," for viewing three tinted transparent glass positives, which, when superposed, reproduced a picture of the original in its natural colours. From the production of these photographic colour transparencies to that of printing blocks which should represent the same three colours, was an easy and natural step, which by 1881 Ives had taken. He showed at the Philadelphia Electrical Exhibition in that year a three-colour reproduction of a chromo-lithograph, produced by the aid of three screens, the negatives being made with bromide emulsion and treated with chlorophyl, eosin and tannin, in order to dissect the colouring contained in the original. Ives showed similar prints at the Philadelphia Novelties Exhibition of 1885, but he thought so little of the idea at that time that he did not

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even trouble to patent it, nor, it may be added, did anyone else, so that the most prominent colour illustrative method of the age has always been public property. The production of grained printing surfaces was, however, patented by several persons, including Fournier, Reaulx and Barret, at Paris (1868), and J. Dredge, in London (1880). Baron F. W. von Egloffstein produced half-tone blocks in the United States, by the aid of a wavy-line screen, as far back as 1864, or thereabouts (see *Inland Printer*, October, 1894). Modern half-tone is, however, mostly associated with the name of George Meisenbach, of Munich, who patented his improvement in the production of cross-hatched photo-process blocks in 1882. It consisted merely in the shifting of the screen during the production of the negative, in order to produce a better grain. Woodbury & Bell in 1883, and Falk of Berlin in 1884, patented methods of half-tone block production, but the Meisenbach blocks ultimately held the field against nearly all comers, including Ives, who had neglected to patent his process in the United Kingdom.

The half-tone screen consists of a couple of plates of glass ruled with very fine lines—which may vary in number from thirty to 200 or more per inch—and placed in contact with each other in opposite directions, so that the two sets of lines are crossed at an angle of ninety degrees, and form transparent squares. The interposition of this screen between the lens of the camera and the sensitive plate which is to receive the image, results in the light reflected from the object photographed being split up into an infinite number of small rays, each passing through one of the tiny squares between the crossing lines of the ruled glasses. The dark parts of the object reflect the light only feebly, and thus the rays, being small and thin, only affect a very minute portion of the sensitive surface, producing, when the plate is developed, a tiny dot. The rays from the lighter parts, on the other hand, being stronger, produce larger dots. As the resultant negative has to be printed through, in order to obtain the ultimate image

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on the sensitised surface of the metal plate that is etched for conversion into a printing block, the scheme of dots which represents the picture is reversed in its tone values, the high lights being represented by small transparent openings, brought about by the joining-up of the corners of the dots arranged in chess-board fashion, as a result of the action of the screen.

The earliest application of half-tone to colour printing seems not to have been made on the lines of the three-colour process, but for furnishing key-blocks to a series of colour impressions from tone plates. These were—and still are—produced by the aid of a coarse "dust ground" of bitumen or resin, the "process" image obtained photographically being stopped-out and etched. This is the French method known as "chromotypogravure," due, we believe, to the joint enterprise of M. Manzi, of the Goupil publishing firm, and the Parisian printing house of Lahure & Co. It is to some extent a modification of the old aquatint process; a detailed account of it will be found in Mr. Gamble's recent book on *Line Engraving* and a briefer one in the next chapter.

The Christmas, 1881, number of *L'Illustration* (Paris) has some of the earliest plates of this description, which exhibit the result of three months' hard work in devising a practicable photo-mechanical colour printing process. There is an eight-page supplement in colour (including a London street scene after a water-colour drawing), printed from blocks in which the tone was partly represented by dots, partly by short broken lines, and partly by a grain not altogether unlike that produced by aquatinting, or by a screen in the form of a coarse textile fabric. This irregularity, quite apart from the date, showed that these blocks, by whatever photo-etching method produced, owed nothing to Meisenbach. Black, red and blue were the colours mostly used, one picture being printed in blue-green on a blue ground, with the high lights routed out.

A few years after, two or three distinct styles of colour work were being used in *L'Illustration*, of which the Christmas, 1889, number furnishes typical examples. The front cover

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has a conventional floral design in four tints and gold, no half-tone or other key block being used in this case. The first of the four colour plates (after a painting by Geoffroy) has the colours applied from etched tone blocks of the usual character, the outline details of the print being supplied by a woodcut, printed last, in black. In the remainder of the colour plates, although the tone blocks were of the same nature as the others, the key block was a half-tone, this—at least—being produced by Angerer and Göschl, of Vienna.

Paris-Noel for the same date displays similar work, the grained tints being overprinted by a half-tone in black, but where this latter was not used its place was taken by a reproduction of a pen-and-ink line drawing, which served as a key plate for the colours. This particular issue contains some technically interesting reproductions of drawings in three crayons, white, grey and black, the latter being printed from a half-tone block with the high lights routed out. In 1883, Messrs. Boussod, Valadon & Co. started *Paris Illustré*, which was largely illustrated in colour. The engraver employed was M. Gillot, whose father was identified with the earliest practicable method of producing line engravings by transfers on zinc, the lines of which were rendered acid-resisting by resin being dusted on, the rest of the surface of the plate being etched away. It was a modification of that method which was used in the journal under notice. Compared with the splendid "chromotypogravures" which are issued, for instance, with the special numbers of the *Figaro Illustré*, these early colour prints are rather crude productions, but except for the natural improvement of style, colouring and finish, the method used for the production of the blocks seems to be the same, prints nearly as good as those of the present day being issued with the *Figaro Illustré* of twenty-five years ago.

This latter periodical was at first only a special Christmas number of *Paris Illustré*, commencing with that for 1883, the avowed object being to rival the Christmas numbers of the English pictorial papers, such as the *Graphic* and the

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Illustrated London News, in which, as we have seen, colour printing was largely used, although almost unknown in France prior to the eighties. In April, 1890, however, *Paris Illustré* was discontinued, the *Figaro Illustré* taking its place as a colour-illustrated monthly. The cover of this initial issue is a fine example of chromotypogravure, the back being devoted to a series of pictorial advertisements, also in colours, of a very artistic and unusual character. The separate coloured plate, a facsimile of Edouard Detaille's "Éclaireur," had the shadows heightened by a thin film of varnish, a style which is now abandoned.

Though it is somewhat anticipating another branch of our subject, attention may be given here to the beautiful series of coloured plates appearing in the *Figaro-Modes*, the queen of fashion papers, which is printed by Messrs. Lahure & Co., and was started in 1903. These are in three or four colours, the latter being generally reserved for portraits, the tints used being the three primaries and black. Only the last is, as a rule, a true half-tone block, the colours being applied from the etched plates already referred to. The subject is photographed and two proofs supplied to the colourist, one of which he passes on to the engraver to make the half-tone block from, but the other he colours, taking as his model the actual tints of the costume it is desired to represent, the background and other accessories being, of course, suitably coloured as well. From this coloured proof the photo-engraver works when preparing his tone blocks, great care being necessary in order to represent the flesh tints properly. The three-colour pictures in the *Figaro-Modes* are usually half-tones.

Fine examples of French chromotypography, as applied to book illustration, are seen in the series of plates in the *Armorial de la Toison d'Or* (1890), reproducing in colour facsimile the Arms, etc., of the Knights of the Order of the Golden Fleece in the middle of the fifteenth century. These pictures almost give the impression of water-colour drawings.

Early examples of the use of half-tone blocks in English

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colour work (not three-colour) occur in the vignettes on the paper covers of the sixpenny *Waverley* edition of Scott's novels, published by Black in 1891. The half-tone block is printed in reddish-brown on the top of the colour impressions, which are in blue and yellow, the lines of the latter being partly solid. In May of that year, the Royal Photographic Society got together for exhibition, on the occasion of a lecture by M. Leon Vidal, a small collection of photochromic prints by all the Continental firms known to produce them, but Messrs. Angerer & Göschl, of Vienna, and Dr. E. Albert, of Munich, were the only ones who were able to furnish three-colour prints produced by letterpress methods, all the others being photochroms or colour collotypes. Dr. Albert patented some improvements in the method of using the ruled screen in colour reproduction, and Ernest Vogel, at the end of 1892, went a step further by using a separate screen for each colour, ruled at different angles. Albert tried later to claim a master patent on the idea of using three screens at angles differing by fifteen or thirty degrees, and threatened proceedings which, if successful, would have paralysed the trade, but fortunately nothing came of it. Three single-line screens had, however, been used by Ives as early as 1881.

The introduction of glass screens automatically ruled, and having the lines engraved into the surface, was an important factor in the development of the three-colour process. It is due to two Americans, Messrs. Max & Louis E. Levy, who were experimenting continuously from 1886 to 1893, in which latter year their first British patent was taken out. There were further patents in 1894, 1897 and 1901, for various improvements in the ruling or patterning of the lines. In the meantime, one firm after another was taking up three-colour half-tone work. Husnik, of Prague, engaged in it about 1891, and in the following year it was introduced into the United Kingdom, the Photochromatic Printing Co., of Belfast, and Gilbert Whitehead & Co. (who used Albert's process), and Waterlow & Sons, of London, being the first to produce

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British three-colour half-tone prints. The process was introduced here from the Continent, and the same was the case in America, where Ives' old method—somewhat glorified and improved—was put into practice by William Kurtz, of New York, in 1892, and soon received the name of Colourtype. The Photo-Chromotype Co. brought it back to the place of its birth—Philadelphia—in 1893, and at the end of 1894 the premier American printing trade journal, *The Inland Printer*, condescended to take notice of the infant process, and to present an example produced by it to its readers; this is a picture of a fish, reproduced from a fourteen-colour lithograph by Paul Bracht, of Chicago. In the same year, a fairly representative lot of specimens of British and foreign three-colour work was got together at the Royal Cornwall Exhibition at Falmouth, and from that time to the present the process has grown apace, and obtained a hold, in the estimation of the trade and the public, which is second to none.

One of the earliest English three-colour prints the writer has seen is the plate presented as a supplement to *Land and Water* for February 13th, 1892, representing "Sainfoin," the winner of the Derby in 1890, this being prepared by Messrs. Waterlow & Sons, Ltd., from colour negatives taken by Mr. Teasdale-Buckell. The Technical Library of the St. Bride Foundation has a copy of this picture, and also separate proofs from the three colour blocks used in its production. The gradual development of the ordinary three-colour half-tone print may be studied in the early volumes of Cassell & Co.'s *Chums*, started in 1893, when trichromatic letterpress printing was just commencing to make its introductory bow to the publishing trade. With the issue for November 30th in that year was presented a coloured plate entitled "Hope," after a design by W. H. Overend, this having been printed from three grained blocks, inked in the primary colours, but the general appearance and texture of the picture were singularly akin to those of the early French colour prints already referred to. Two months later (January 25th, 1894) there was another print, representing "The

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THE DESERTED VILLAGE.

Illustrated in Colour by LEE HANKEY, and Published by CONSTABLE & Co., Ltd.

Produced by

CARL HENTSCHEL, Ltd

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Start of the University Boat Race," in which the grain ot the blocks approximated more to that of ordinary half-tone. On August 30th, the print of *Chums* appeared, in a still more advanced style, though much of the surface of the red block was solid. From the commencement of 1895, however, three-colour prints of the ordinary type began to appear at intervals, with an occasional variation in the way of a full-page woodcut printed in red or green ; most of the three-colour blocks bear the imprint of Husnik & Hausler, of Prague. The decoration of book covers in colour is fairly common, but in most cases the colours are applied to the cloth in a blocking press. The cover of the *Process Year Book* for 1905-6 (London, Penrose & Co., Ltd.) provides an example of trichromatic printing on cream-coloured cloth from half-tone blocks. The design, of an early sixteenth century character, was modelled in clay, in high relief, by Mr. G. S. Littlejohn, and afterwards tinted for reproduction. Colour negatives were taken and three blocks prepared in the usual way by the Swan Electric Engraving Co.

Compared with most of what has gone before, much of this seems very modern history indeed, but the younger generation, who have scarcely known any other colour printing process than trichromatic half-tone, will perhaps be surprised to learn that twenty years ago it was practically non-existent. As in Le Blon's day, there has been great controversy about the advantage—or otherwise—of using a fourth or black block, and the champions of the German "Citochrome," of the American "Quadricolour," etc., are loud in their praises of the particular method they swear by. A four-colour print of a fire scene, dated 1899, may be seen in the *Inland Printer* of Chicago. But as Mr. Gamble deals with modern colour processes in the concluding chapter of this book, and presents some additional facts bearing on their history, it will not be necessary for the writer to dwell any longer on this branch of the subject.

The number of half-tone blocks that may be used for the

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production of a coloured picture varies from one up to half a dozen or more, although in these latter cases the multiplicity of grains is apt to confuse the outlines. Examples of six-colour half-tones may be seen in M. G. Vuilliers' *La Tunisie*, printed by Mame at Tours in 1896. Printing in two colours from a single surface has been practised for several years, chiefly by the aid of a " veil " over the part intended to apply the second colour, although other and more complicated methods have been tried or proposed. In 1905, Signor V. Turati, a printer at Milan, brought out a process which he termed " Sincromy," in which an impression in black from a half-tone block was inked in a number of tints from a slab of solid colour; the tints were arranged in mosaic fashion, the surface being automatically damped before each application of the " ink " to the surface of the block. In the ordinary way, however, printers who only use a single block for colour work are content with the effect produced by the so-called " double-tone " inks, in which certain chemical substances are added to the colouring matter, imparting to it the property of giving both a tint and a shade of the same colour with a single inking of the block, the depth and tone of the colouring varying with the lights and shadows of the picture. This is a practical solution of a problem which had occupied many inventive brains since at least 1867, when a Frenchman named Roger suggested mixing, with inks of various colours, chemicals that would repel one another like oil and water, so that an inking roller could be charged with, say, three colours at once, without incurring any risk of their blending and thus spoiling the intended effect.

Half-tone prints in two colours, blue and brown, appeared on the covers of *The Chase* as early as 1891, but fifteen years since there was still only a single London photo-engraving firm that made a speciality of blocks for this class of work. The use of two colours, whether they be primaries or not, generally provides a three-colour picture, as if the colours, for example, be blue and yellow, green will be produced at the points where

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STREET VIEW IN DINAN, BRITTANY

By W. L. Casey

Original in possession of Victoria & Albert Museum.

Blocks by students of L.C.C. School of Photo-Engraving and Lithography.

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they overlap; but it is usually found to be an economy, in cases where a special design is furnished for reproduction in two colours, to produce it in two primary tints, and make a couple of half-tone blocks therefrom through colour filters in the ordinary way. The result is oftentimes rather startling, not to say unnatural, but the cheap novel or magazine publisher generally wants something gaudy, and cannot waste time in selecting harmonious colour schemes.

A photo-etched block for colour printing is not necessarily a half-tone, as a line block will often suit the purpose quite as well, if not better, besides being cheaper. It could, of course, be worked in colour as a line block pure and simple, but this method is scarcely ever followed, it being more usual to give a grain—or, as it is commonly termed, apply a "tint"—to parts of the drawing before it is photographed for reproduction. This "tint" is applied from a so-called "shading medium," introduced by an American named Day in 1883, *i.e.*, a film of gelatine backed with celluloid varnish, and patterned on the gelatine side, in slight relief, with a regular system of lines, dots, etc., which is inked and transferred to the design.

As the colour scheme is due to the taste—or otherwise—of the artist or printer, and in no wise dependent upon colour selection by the camera, as many, or as few, colour blocks may be prepared as desired for the purpose of colouring a line engraving. Some processes of this kind are largely used for the production of the better class of children's books, in the illustrations of which the outline is printed in black by an ordinary line block, and the colouring applied from grained blocks, produced by the aid of shading mediums or by some similar method. An early example of this class of work is seen in *The Coloured Bible for the Young*, published by Routledge in 1884. It contains 125 illustrations in black and two or three colours, the solid parts of both the black and the colour blocks being relieved by occasional patterning of certain spaces; they were engraved and printed by James Moir, of Edinburgh. Messrs. Chambers' *Twentieth Century Primers* (1905)

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furnish fairly representative examples of ordinary coloured line engravings, as used in low-priced books. A description of the process of preparing line engravings for colour work forms the subject of a chapter in Mr. W. Gamble's *Line Engraving* (1909); the frontispiece to that work is a four-colour line engraving, *i.e.*, the three primaries applied to colour a reproduction in black of a pen-and-ink sketch, separate proofs of each of the four blocks used also being given.

Coloured illustrations from a combination of line and half-tone blocks appeared in the *Million*, a penny illustrated weekly started by Messrs. George Newnes, Ltd., in 1892. Each issue had four pages printed in colours from grained zinc blocks, generally the three primaries (a black half-tone being often used as well), although there was no attempt at producing three-colour prints as we understand the term to-day. The journal had a career of two or three years, and its decease was followed by a long interval, during which there was no cheap English periodical illustrated in colour. Then in 1902 two gentlemen who had been concerned in journalism in Ceylon started *The Coloured Pictorial*, and sunk a considerable sum of money in laying down plant for its production; in this case half-tone blocks were used, the pictures being in one, two, or three colours. Ordinary Wharfedale machines were used, three in series, and the idea was to immediately pass the sheets from one machine to the other, using some special additions to the ink to facilitate quick drying. But the printers were not able to get good register, and thus the colouring was so poor that the public never took kindly to the paper, and it ceased to appear after about half a dozen numbers had been published. At the present time, the cheap colour-illustrated press is chiefly represented in this country by such publications as Messrs. Harmsworth's *Puck*, started in 1904, and printed from the web on rotary machines in four colours, from nickel-faced line blocks, by the London Colour Printing Co. That firm produced for the proprietors of the *Daily News*, in the early part of this year, *Pictures of the New Parliament*, which

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contained a Political Chart for 1910, in red, black and green, and the *Daily News* for February 12th had an article descriptive of the processes employed. In the United States, stereotyped half-tone blocks were printed in several colours on rotary newspaper presses from 1888, when the Christmas numbers of the New York *Herald* and *Journal* brought out coloured supplements produced at the rate of 48,000 copies per hour. The *Boston Post* issues with its Sunday edition a coloured section of sixteen pages, printed in four tints by stereos prepared from zinc plates grained by shading mediums. This is a class of work that is practically unknown in this country, although the colour-illustrated weekly is common enough on the Continent, papers like the *Petit Journal* at Paris, the *Simplicissimus* at Munich, the *Blanco y Negro* at Madrid, and *La Domenica del Corriere*, printed on rotary machines at Milan, having contained coloured pictures in their ordinary issues for some years past.

The introduction, and subsequent rapid progress, of methods of producing printing surfaces by photo-etching has practically killed wood engraving, except for catalogue illustration and one or two other special classes of work. But the older art has, to a limited extent at least, "got its own back" by cutting into a domain previously sacred to "process," *i.e.*, three-colour work. Trichromatic lithography, collotype and half-tone have already been dealt with, and no doubt Mr. Saalburg or his English rivals will shortly provide us with something in the way of trichromatic photogravure. It now only remains for us to speak of trichromatic xylography, in order to make our chain of three-colour processes complete. The little that has been done in this direction is rather of an experimental than of a practical character, and it is hardly necessary to say that the three-colour woodcut is not an English production. It is rather surprising, however, to find it in America, where Mr. G. Koch has engraved blocks for some prints of this kind, including one of a Dutch cottage interior. In France, M. Leon Enfer is one of the chief exponents of this style, and he approximates more to the old

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woodcut manner, whereas Koch's prints look rather like three-colour half-tones. In each case there are three blocks, inked in bluish black, red and yellow respectively, and as the lines made by the graver are cut up, in the higher lights, into dots to render the half-tones, the methods employed to produce the colour effect are very much the same as in photographic three-colour, save that no camera is used, and that the blocks are hand-engraved woodcuts.

Although almost banished from England, the woodcut is still a power in the printing world on the Continent, particularly in France, where many quite modern books have been illustrated from wood engravings, either printed in or supplemented by colour. Some works issued by M. Hetzel, a Parisian publisher, furnish good examples, such as the *Bourses de Voyage* (1903), in which woodcut impressions in black are coloured in red and blue from tone blocks. Some ten years since, an attempt was made by the publishers of *Modern Art and Literature* to acclimatise coloured woodcuts (which in that case were "made in Germany") in this country, but without success. Mr. C. H. Shannon and Mr. Gordon Craig have produced a few woodcuts for printing in colour, usually in flat neutral tones, but the most noteworthy modern exponent of the coloured woodcut is undoubtedly Mr. Lucien Pissarro, the shining light of the "Eragny Press." He is the son of M. Camille Pissarro, a well-known French etcher of the impressionist school, who occasionally worked in colour. Lucien developed a taste for wood engraving at an early age and obtained an opening in Paris, but soon lost it owing to the distaste felt for his peculiar style. Thus disappointed in his own country, he came over to England in 1893 and became associated with Mr. Ricketts, of the "Vale Press," in whose types Pissarro's first books were produced, at Epping in 1896-7, and later at the Brook, Hammersmith, a locality much affected by the art craftsman. The earliest, and also the most noteworthy, was Margaret Rust's *Queen of the Fishes* (1894), which is a peculiar volume in more ways than one,

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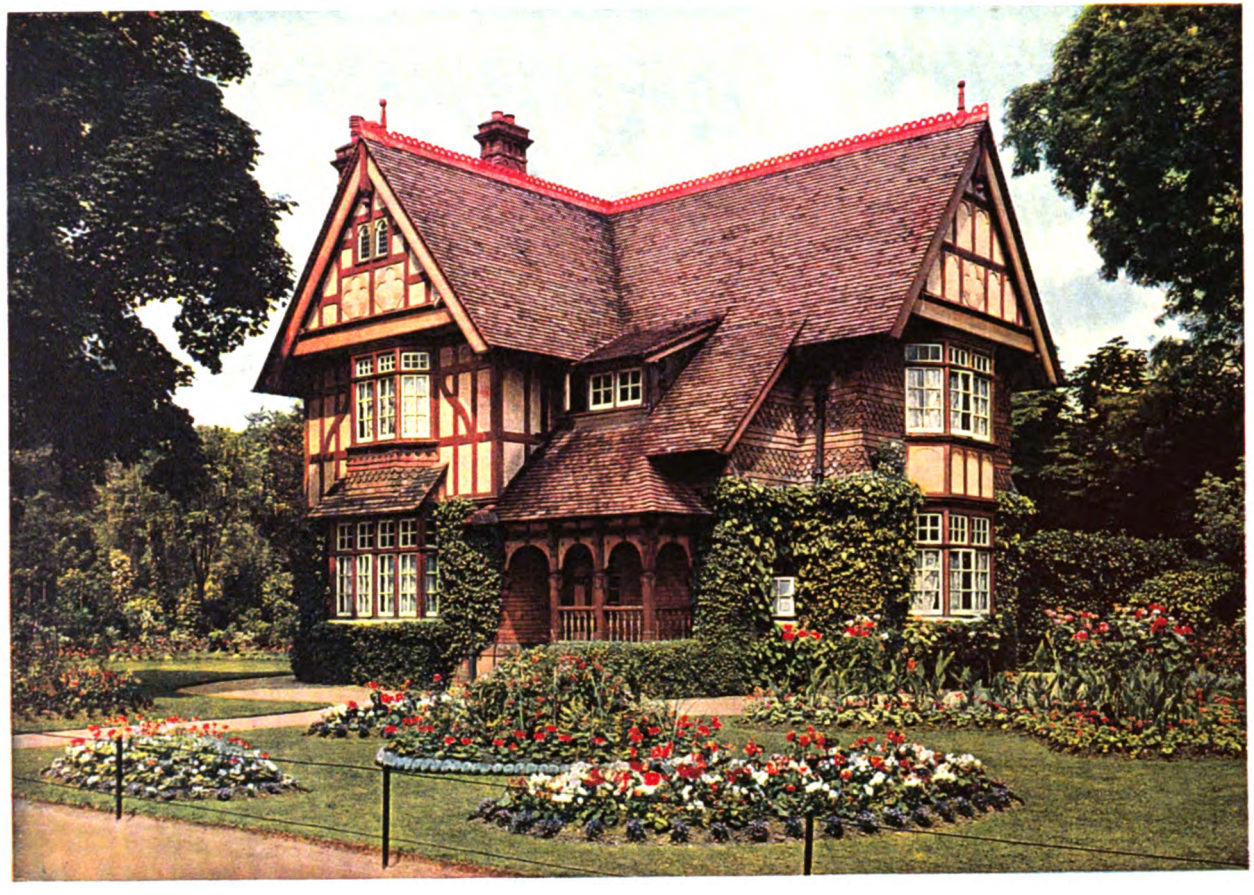

Direct from Nature.
An example of Three Colour Half Tone Reproduction
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consisting of only seventeen pages, printed on one side of Japanese hand-made paper, in the fashion of the Chinese books. The text was written out in the style intended and reproduced by photography. There are sixteen woodcut illustrations, of which one is printed in five colours, and four others in four, whilst eight are in grey, and the remaining three in red. The title is printed in gold, as well as the border to the frontispiece, which is repeated four times elsewhere, but in green. Mr. Pissarro's coloured woodcuts are quite different from anything else of the kind, the tints being of a thin filmy water-colour character, although the colour scheme seems to lean towards that of the chiaroscuro woodcuts of the old Italian type. This volume is the only one produced on so elaborate a scale, the later ones being illustrated mostly by woodcuts printed in black, with an occasional one in colour. *Aucassin and Nicolette* (1903) has a woodcut frontispiece in four colours, the text being in black, with large ornamental initials in red. A selection of *Songs by Ben Jonson* (1906) has a circular frontispiece in colours of a rather cloudy nature, and in this case the text of the book is in red and black throughout, with music of the old Gregorian character. Diana White's *Descent of Ishtar* (1903) has the frontispiece and first page of the text surrounded by an ornamental border printed in green. The colour-printed paper of the covers, usually of two shades of greenish-grey, gives a distinctive character to the publications issued from the Eragny Press, which, by the way, takes its name from a village in Normandy.

Although designed and executed by a Frenchman, the colour decoration of these books cannot be considered as of French character. Nevertheless, it is to France, or at any rate to the Continent, that we have to look for any really original effects in modern colour printing. A glance at the windows of the average high-class London bookseller's shop will be sufficient to convince that the British publisher has apparently no conception of the existence of any other illustrative process than the hackneyed three-colour half-tone, and if anything

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different ever be suggested to him, it is almost invariably by someone representing a foreign house, or in close touch with foreign methods. Indeed, it would be difficult to name an important colour printing process that was constructed on an absolutely new foundation by a Britisher. Baxter leant on Savage, as he in turn leaned on Jackson, and he on the older foreign chiaroscuro engravers. In the same way, Hodson's and Leighton's modified aquatint methods were based on Le Prince's invention, and Jones's chromo-lithography probably owed something to the earlier German workers.

Printing in colours on modern lines was initiated in Paris, as we have seen, as early as 1881, a date which may thus be regarded as that of the dawn of the revival of colour printing in France. Its most original production, of late years, has been colour-etching, which is the last process the writer has to speak of in this book. A contributor to the *Studio*, a few years since, characterised this as an art "as capricious and uncertain in its results as it is dubious in its convention," but with the latter point we are not concerned here. Mr. Hinde, in his *Engraving and Etching*, enumerates nearly a dozen modern colour-etchers, but there is little or nothing to be gleaned from him as to the nature of their methods or the character of the results. There are also several others whom he does not mention, including Thaulow, Trowbridge and La Touche.

The production of etchings in colour is not an absolutely new process, for as long ago as 1839 a Londoner named Henry Griffiths obtained a patent for an invention of this kind, using one plate for each tone required, the outlines being usually bitten in on steel. Griffiths prepared prints by his method for a few books published about that time, including one dealing with the new Anglican Cathedral at Jerusalem (1842), but in all the copies of this the writer has seen the printed colour was supplemented by hand work; Griffiths' inks, too, seem to have been of a rather fugitive character.

The modern development of colour-etching in France, as a

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means of book illustration, owes much to that well-known author, M. Octave Uzanne. It is in points such as these that the producer of the French volume *de luxe* differs so largely from the English; the latter, as witness the productions of William Morris, strives to present an almost unreadable work, of mediæval character, in a mock-antique garb, whereas the Frenchman issues a modern work, of current interest, in a dress of the very latest Parisian type. M. Uzanne's *L'Eventail* (1882) is an early example; the illustrations, from designs by Paul Avril, are on the text pages, and being vignetted and printed first, are in places partly beneath the text. The colours are very varied, but only one is used for each illustration, which is of the nature of a photo-engraved reproduction of a wash-drawing. Coloured etchings of a much more advanced character, and in the form of separate "aquarelle" plates, appear in the same author's *Son Altesse la femme*, issued in 1885 by the Maison Quantin, who also got out the previous book. Several artists were employed on the production of the plates, including Felicien Rops, and the general effect suggests the work of Debucourt a century before, though the processes employed probably had photogravure as a basis; E. Charreyre was the engraver and printer. M. Uzanne had a half-playful reference to the subject in his preface, in which he said that he did not propose to patent the method used, nor to enter into a detailed description of it. The actual photo-etching seems to have been coloured by tone blocks or plates, not altogether unlike those used in the contemporary Parisian illustrated journals already mentioned, and in the preparation of which a rouletting tool was perhaps used.

A process of etching for colour printing, that was much used in France for book illustration about this period, was that known from its inventor, M. Gillot, of Paris, as "Gillotage." The design was drawn or transferred on to zinc or copper in lithographic ink, and the lines dusted over with powdered resin; the plate being then rocked in an acid bath, the surface

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was eaten away except where it was protected by the resin, and a line block produced. It is evident that by transferring or washing-in broad masses of colour, tone blocks could be produced for the purpose of colouring the line impressions, and when the dust-grain ground was fine instead of solid, and the ink of a proper shade and consistency, it made the imitation of water-colour drawings (or "aquarelles," as the French term them) a comparatively easy task. M. A. Silvestre's *Conte de l'Archer* (Paris, Rouveyre & Blond, 1883) is generally looked upon as the first French book of any importance that was illustrated in colour by this process. The blocks were engraved by Gillot after the original water-colours by A. Poiron, and printed by Messrs. Lahure & Co. All the illustrations are on the text pages, so that the volume recalls in some measure Evans's edition of Goldsmith's *Poems*, mentioned in a previous chapter, but that was illustrated by tinted woodcuts, whereas the volume under notice had etched tone plates. The title is a fine piece of work, partly printed in gold. Giron's *Les Cinq Sous d'Isaac Laquedem*, published the same year, is a characteristic example of the younger Gillot's engraving for colour printing. It contains, besides a title-page in colours, eight facsimiles of water-colour drawings. Another good example of "Gillotage" applied to colour printing is the series of illustrations after F. Lix, in an edition of the *Voyages de Gulliver*, published in 1888.

Much excellent colour work is seen in some of the volumes published—in very limited editions—for the Société des amis des Livres, founded at Paris in 1880. Artists, engravers and printers alike gave of their best to the production of these charming works, which were, in many cases, got out under the supervision of M. Octave Uzanne. The Chevalier de Bouffler's *Aline, Reine de Golconde* (1887), in this series, is a typical French production, engraved throughout in a script hand, and illustrated with delicate little etchings, four of which are in colours. It was printed by the Maison Quantin, on hand-presses. An edition of Alfred de Musset's

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Lorenzaccio was produced for the Société by Lahure & Co. in the same way in 1895. The blocks for the illustrations were engraved by Ducourtioux & Huillard after water-colours by A. Maignan, and printed in four colours—red, blue, grey and bistre. These little prints, like most of those in the Society's books, almost constitute a type in themselves, and the same remark may be made anent the fine colour illustrations to Gaillardet and Dumas's drama, *La Tour de Nesle* (1901), which was printed by Renouard, the blocks being engraved by Bertrand after Robida. Both in grain and appearance, these suggest mezzotints in colour, inked *à la poupée*, but they are evidently etchings in black, coloured by successive impressions from photo-etched tone blocks. This is one of the most handsome of the Society's colour-illustrated volumes. In their *Annuaire* for 1896, M. Paul Avril, a well-known Parisian artist, had a short paper descriptive of the various methods of engraving for colour printing, and in it made brief reference to the process of tinting *au patron*, which is practically stencilling in the Japanese fashion. Even this simple operation is now performed automatically, by means of M. P. Orsoni's "Aquatype" machine, first brought out in Paris about 1898. The sheets or prints to be coloured are fed on to a travelling band, which carries them in turn under as many stencils as there are colours to be applied, when another portion of the mechanism passes a colour brush over the stencil then in position on the sheet. Some of the French fashion papers have their plates tinted by this machine, which is also extensively used for picture postcards.

Amongst the most recent French art books illustrated by colour etchings may be mentioned *La Dernière Nuit de Judas*, by E. Gebhart (Paris, Ferrand), with thirteen beautiful colour designs by Gaston Bussière. The text of the volume is in a semi-gothic type, with coloured initials in the mediæval style, each page being surrounded by a border in black and colour. M. A. Thalasso's *Deri Séadet*, a picture book of Turkish scenes (Paris, H. Piazza & Co.), has a series of fifty

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colour-etched illustrations by F. Zonaro, printed on the text pages.

The "colour-etching" of the printsellers' shops is almost invariably a foreign—generally a French—production. Like other prints from intaglio plates, it can be produced in either of two ways, viz., in several colours at one impression, by inking the plate *à la poupée*, or by the use of a separate plate for each colour. The former is the more common method, and is used by, among others, Richard Ranft, of Geneva, and Allan Osterlund, of Stockholm, whose "dust-ground" aquatint etchings are very popular with those who are interested in this branch of art. M. P. G. Jeanniot, on the other hand, uses several plates for the production of his colour etchings, and this seems to be generally considered the best method for really high-class work. Practically every colour-etcher has his own peculiar mode of working, but the principle varies little. Mr. Vaughan Trowbridge, a New York artist, produces etchings in colours by a process he learnt in Paris. He inks the surface of his etched plate in various tints, and takes an impression from it as in relief printing. He then fills the incised lines of the plate with vari-coloured inks, and wipes the surface clean, or nearly so, as in the ordinary printing of etchings, registers the sheet with the first impression carefully on the plate, and pulls the second impression on it. The print thus requires two workings in place of the one generally used for intaglio plates in colours, but in this respect Mr. Trowbridge is only going on the lines adopted by some other colour-etchers. One of the most popular producers of this class of coloured prints is M. Fritz Thaulow, of Paris, his pictures also being the result of successive workings of the same intaglio plate. In producing the design, a variety of methods is used, the outlines being prepared with needle and acid in the usual way, whilst the shadows, etc., are put on with an aquatint grain. The plates are etched rather deeply, and the black impression printed in a very dark ink. For the colours, the plate is re-inked with a pad *à la poupée*, and a proof pulled to register

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on the paper with the black one. M. Thaulow generally takes 200 prints from the plate, twenty or twenty-five of which he retains, putting the others on the market at £5 each, a price at which they seem to sell readily. Some British art galleries, including the Municipal ones at Manchester and Bradford, are among the purchasers, and several of the earlier prints command a heavy premium, selling in certain instances for as much as £20 each. M. Thaulow's "Washerwomen at Quimperle" is a good example of his style, a feature of which is the dense shadows. M. J. F. Raffaelli is another Parisian colour-etcher. As far as can be judged from results, his prints are likewise produced by successive printings from the same plate, one serving for the black and another for the colours. These latter do not, however, occur in solid masses, as in M. Thaulow's work, but in groups of small lines or patches, so that the greater part of the surface of the paper is left uncoloured by both workings. Three tints seem to be the average number used. Colour-etchings of a different type, although probably printed by a similar process, are produced by Miss Mary Cassatt, of Paris. In this case the etched portion only extends to a few scratches on the plate, the effect being mainly due to the thin but rather vivid colouring, which is applied in broad stripes or masses over a large part of the picture.

Although its exponents have been fairly numerous, the art of etching in colour had no book exclusively devoted to it prior to the publication of Herr Vojt Preissig's *Zur Technik der Farbigen Radierung und des Farben Kupferstichs* (Leipzig, 1909), which contains a few simple colour illustrations exemplifying the author's methods, both for two and three-colour prints. His tone blocks have a coarse open grain, somewhat resembling in appearance the "dust grounds" so popular with French colour-etchers; a little line etching also enters into the pictures. The process, and the tools and apparatus necessary to operate it, are described in full detail, with numerous illustrations, and the work has the further advantage of possessing a short bibliography of books on etching methods. Herr

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Preissig aims at simplification of the present slow and expensive process but it will probably have to be still further simplified —and, what is more, cheapened—before it can take a place as a commercial means of producing colour illustrations for moderately-priced books.

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CHAPTER X

MODERN COLOUR PROCESSES

By William Gamble, Editor of the "Process Year Book"

ALMOST as soon as photography was invented, the idea was conceived of making it the means of reproducing natural colours. For a long time it was the dream of the early experimenters that some means would be found of permanently recording the colours seen on the focussing glass of the camera, but it was not until 1861, when J. Clark Maxwell, in a lecture delivered at the Royal Institution, suggested the theory of a three-colour system, that the investigation of the subject began to proceed on any well defined lines. Dr. Thomas Young, in 1802, had put forward the theory that there were only three fundamental colour sensations, but his idea was discredited and forgotten until 1853, when Professor Helmholtz again brought it forward and strengthened it by his experiments. Clark Maxwell, proceeding on the same lines, proved pretty conclusively the correctness of Young's early assumption, and among the experiments shown in Maxwell's lecture demonstration was one in which three photographs of a coloured ribbon, taken through three coloured solutions, were introduced into a lantern, giving the images of the red, green and blue parts separately. When these were superposed a coloured image was seen, which, if the red and green images had been as fully photographed as the blue, would have been a truly coloured image of the ribbon.

The obstacle to carrying out this idea was that the photographic plates of that time were not sensitive to green and red, but in the course of the quarter century that followed

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means for producing colour sensitive plates were discovered, and such plates were employed in the manner suggested by Maxwell.

The first suggestion to apply the idea to colour printing was by Baron Ransonnet in Vienna, in 1865, and Henry Collen (the Queen's drawing-master), in the same year, proposed to make three negatives from a coloured subject, through a red, yellow and blue medium respectively. These three negatives were to be printed in red, yellow and blue ink superposed on paper. This proposition, however, seemed to ignore the important fact that the rays producing the negatives must not be the same as the colour of the printing inks.

Ducos Du Hauron and Charles Cros, in France, put forward similar ideas in 1868, but they found they could not carry out their ideas for want of suitable photographic plates.

In 1873, Professor Vogel, in Berlin, found that a photographic plate could be made sensitive to different coloured rays. This again stimulated various inventors.

In 1885, Professor Vogel laid down the principle that the dye used for staining the photographic plate, to make it colour sensitive, must be of the same colour as the dye or pigment used for making the printing ink; or, if the sensitising dye could not be turned into a printing ink, an ink must be selected which shows a spectroscopic efficiency as alike as possible to the sensitiser. This was a mere assumption, which was only partly true when considered in relation to the dyes known at that time. In the light of our present-day knowledge, it can only be regarded as an antiquated working hypothesis of historical interest.

Again years passed, and Professor Vogel's publication did not seem to have had any influence on the results of the early experimenters, probably because photographic plate manufacturers and ink makers did not apply the professor's recommendation as they might have done.

Ulrich, a litho artist in Berlin, was the first to take up Professor Vogel's idea, but in practice he came to the conclusion that the three colours were not sufficient to produce

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grey and black; therefore he thought it necessary to add a greyish tint. Some of his results were shown at the German Exhibition in London in 1891, where he took a medal.

About the same time, a London lithographic firm, Messrs. Gilbert Whitehead & Co., commenced working a three-colour process with the assistance of Dr. E. Albert, of Munich, but although some results were published, both in letterpress and collotype, the venture did not prove successful.

In the meantime, however, the process had been improving in Germany very considerably, through the work of Professor Vogel's son, Dr. E. Vogel. His chief aim was to do away with the fourth printing plate, and so prove in practice that the theory of three-colour was correct. Departing from the practice of previous experimenters, who had started from the photographic end, and then essayed to find suitable printing inks, he first selected three inks, and then found sensitisers to accord with these as far as was practicable, finally producing the three coloured mediums for photographing through. The method of printing adopted was collotype, and a factory was started for the purpose of carrying on the experiments. At an exhibition in Berlin in 1892 some astonishingly good results were shown, and the invention was sold in the same year to Mr. Wm. Kurtz, of New York. Collotype, however, could not be worked successfully in America, owing to climatic conditions, and therefore Kurtz had to apply the process to letterpress printing. In 1893 a still-life subject, consisting of fruit, was shown, the prints being worked off on the ordinary typographic press. The result was considered wonderful at the time.

In 1893 a syndicate was formed for acquiring the rights of the process for Great Britain, but as they failed to float the enormous company scheme attempted, the process was dropped again.

An inventor who had been concurrently at work developing three-colour work on different lines was Mr. F. E. Ives, of Philadelphia, who as early as 1889 published a communication

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on the subject in the *Journal of the Franklin Institute* and had produced practical three-colour prints some years before, and who, indeed, claims to have either preceded or evolved the process simultaneously with Vogel. Mr. Ives was the inventor of the ruled cross-line screen now universally used for the half-tone process, and was the earliest to lay down the principles of its use. Undoubtedly, it is due to the development of the half-tone block process towards perfection that the three-colour idea was made practicable.

The first business founded to work the three-colour block process on a commercial scale in England was the Photochromatic Printing Co., associated with Messrs. Marcus Ward & Co., in Belfast. The business, which was founded and managed by Mr. Martin Cohn, who had come from the Continent full of enthusiasm for Dr. Vogel's process, was afterwards transferred to London, and was run under the name of the Heliochrome Co., with works at Notting Hill. Some excellent work was produced, but the venture was not a financial success. Mr. Cohn afterwards joined the firm of Orford Smith, Ltd., at St. Albans, to again work the process, but this huge printing business came to grief, and Waterlow & Sons were the next to take over "Heliochrome." By this time the three-colour process had become common property, and numerous firms had commenced doing it, so that it is hardly possible to trace further the chronological order of its development.

The method at first adopted for three-colour block making was known as the "Indirect Process." Three negatives were made on dry plates through colour filters. The negative for the yellow printing plate was usually taken through a blue violet filter on an ordinary plate (not colour sensitive), because the blue-violet sensitiveness of an "ordinary" plate is sufficient; the negative for the red printing plate was taken through a green filter on a green-sensitive dry plate; and the negative for the blue printing plate was taken through a red filter on a red-sensitive dry plate. Having obtained

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these three record negatives, positives (*i.e.*, glass transparencies) were taken from them, and these positives were copied through the half-tone screen, so as to obtain the half-tone negatives for making the printing blocks. This was a roundabout process, involving nine operations, so that the work was necessarily slow, expensive and uncertain, a fault of one or other of the operations probably throwing out the whole set, unless the defect was remedied by hand work.

The progress of three-colour work was aided by the researches of Sir W. de W. Abney in sensitometric tests; by Mr. F. E. Ives in improving his Photo-chromoscope; by Mr. E. Sanger Shepherd in standardising colour screens, by Mr. C. G. Zander in standardising three-colour printing inks; by Dr. E. Valenta, Dr. Miethe, Baron von Hübl, and others, in investigating the photographic properties of dyes, and by Mr. Max Levy in ruling screens of suitable angles for the overlapping colours.

This matter of screen angles was one of the early difficulties of the colour process. It was found that if two or three colours from a given ruling, say one at 45° to the sides of the plate, were superposed, an offensive pattern, something like the moiré or water-marking of silk, was formed. Dr. E. Albert, of Munich, claimed to be the first to have discovered that if different angles were chosen, each varying from the other 15° or 30°, this pattern would disappear.

Dr. Albert must be given credit for furthering the improvement of three-colour methods, by his introduction on the market of a colour-sensitised collodion emulsion, which gave a much better colour rendering than dry plates, and at the same time produced a negative which was more suitable for process work.

In 1899 Messrs. Penrose & Co. introduced Dr. Albert's emulsion into England, sending Mr. H. O. Klein to Munich to study the process with a view to instructing English workers. The Arc Engraving Company had in 1897 worked with some success a collodion emulsion process with the aid of an Austrian expert, who afterwards brought it to greater perfection at

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Messrs. Carl Hentschel & Co.'s studios. Examples of the most recent work of these two firms are given in this book. It is to this collodion emulsion process that we owe what is called the " Direct Process," first made known to the trade in 1902 through the experimental laboratory of Messrs. Penrose & Co., which reduced the nine operations of the " Indirect Process " to three. The first set of negatives was taken not only through the colour filters but also through the ruled screens at the same exposure, and these formed both the colour records and half-tone negatives in one. Naturally, better colour rendering and more perfect register was the result. This direct collodion emulsion process is still in use at the present day in most of the large commercial houses in England and on the Continent, improvements having, however, been made in the colour filters and the sensitising dyes, Mr. H. O. Klein having worked out the adjustment of the sensitiser to the filter, and the preparation of the sensitisers suitable for this direct work.

Dr. Albert has introduced recently a so-called " filterless " emulsion process, the plates being so strongly dyed as not to require the aid of colour filters, but it must be regarded as an unsuccessful experiment, leading, however, to the introduction of new sensitisers and a readjustment of the colour filters. It was found desirable to use at least a " compensation filter," consisting of a yellow medium to retard the strongly acting ultra-violet rays ; and it is better still to use a bluish-green filter for the red printing plate, the yellow filter being used for the blue, but no filter being required for the yellow printing plate. This has brought about a great reduction of exposures and almost ideal colour separation.

The improvements made by dry-plate makers in colour sensitive plates, and especially in panchromatic plates—*i.e.*, plates sensitive to all colours—led to efforts being made to use dry plates for the direct colour process. Mr. E. Howard Farmer, of the Polytechnic School of Photography, achieved some successful results in this direction, and his process was taken up by several commercial firms. More perfect

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panchromatic dry plates, which have been introduced of late, have led to the direct process with dry plates becoming extensively worked, and opinions are now divided as to the relative advantages of collodion emulsion and dry plates.

Printing-ink manufacturers have also improved their inks for three-colour work, and there is now a number of excellent sets of inks on the market. The theoretic requirements of the three-colour process in the matter of printing inks have now been closely determined, but so far it has not been found possible to provide correct inks of the necessary permanency. It has accordingly been found desirable to issue a series of non-permanent inks that can be used for colour work in books and periodicals, which are not likely to be exposed to light, and a permanent set, not strictly correct, for prints which have to be exposed to light, such as framed pictures, showcards, etc. The order of printing is almost invariably yellow, red, blue.

The improvement in printing due to the introduction of more perfect machinery has had a considerable influence on the three-colour process. The Miehle, Century and other American machines of the two-revolution type were found to give much more perfect register and increased inking power, which was all in favour of the three-colour process, and English and German machine makers soon followed on the same lines. A large amount of colour work is also done on platen presses, which have been improved in strength of impression and inking power of late years, specially to meet the needs of half-tone and colour printing.

Many attempts have been made to do multi-colour printing continuously, but at the time of writing these efforts cannot be said to have been completely successful, so far as the regular three-colour blocks are concerned. The Orloff press, which was an elaborately constructed machine for four or five colours, seemed at first promising. The colours, instead of being printed direct on to the paper, were set-off on to a composition roller, until the latter had received the entire colour scheme, when it transferred it to the paper. It was found that this

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machine was only adapted for light tinted blocks, such as are used for bank note and cheque printing, and to this class of work the machine has now been consigned. The Lambert machine, a French invention, was still more promising. It is a flat-bed machine, which may be described as consisting of four machines blended into one, as there are four beds for the blocks, four ink slabs, four sets of rollers and four impression cylinders. The sheets are fed in at one end, and are carried automatically from one cylinder to the other, emerging at the delivery board as finished four-colour prints. The work is of a good commercial quality, though it cannot be said to be so perfect as that produced by printing the colours separately. Another ingenious attempt to secure continuous printing is by means of the Tandem Miehle. Three machines are joined together by means of a special delivery apparatus, so that when the sheet leaves one machine it passes to the next, and so on to the third. It is found that the printing is perfect enough so far as uniformity of inking and register is concerned, but the difficulty of insufficient drying of the colours between each impression prevents the successful use of the machine for formes which have to be heavily inked. Two-colour machines are sometimes used for four-colour printing, by dividing the ink fountain at each end into two parts, and running a separate colour in each part. This is fairly successful with "doctored" inks on certain kinds of work. In America, a crude kind of colour work for Sunday newspapers is done on fast running rotary machines, but neither the colour nor the register is good. The colours are applied from hand-worked plates, attempts to apply the photographic three-colour process having met with little or no success. At the time of writing, a process known as "wet colour printing" is being developed in America by means of a special rotary press, the success being due to "doctoring" of the inks and the use of electrotype plates which have been embossed by a process of overlaying, so that the shadows and darker tones stand up in varying relief. The sheet is held on the impression cylinder

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The Stream.

J. C. Hook.

Engraved and Printed by
Andre & Sleigh, Ltd.,
Bushey, Herts.

Example of new "Screenless" process.

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until all the colours in succession have been printed on it, and at every revolution of the cylinder a complete copy in four colours is made. The original plates are half-tones. The method is being used for the covers, fashion plates, and advertisement sheets of such papers as the *Ladies' Home Journal*, in four or five colours.

Whether to use three or four colours has long been one of the contested points in colour work. The theoretical advocates of three colours have stoutly held out for three-colour, but many practical men hold the faith that three colours can never give an entirely satisfactory rendering of the subject. The weakness of the three-colour process is chiefly found in the rendering of blue in all its gradations, in its inability to yield a good grey, and in the imperfection of the blacks, which according to theory should be formed by the superposing of the three colours in equal strength. The remedy proposed is to use a black or neutral grey as a fourth printing. Dr. Albert advocated this in his Citochrome process, and many leading Continental workers have followed him. In America a firm known as the Quadricolour Company make it a rule to use four colours, and do admirable work. It is, indeed, quite general in America to find four-colour being given the preference to three, especially in blocks produced by hand processes. In England, though four-colour work is not so general, a fourth printing in black is often resorted to, or one of the trichromatic colours is run twice through to get increased strength. Messrs. Bemrose & Son's print, "The Lady Hildegarde," is an interesting specimen of four-colour printing.

An interesting attempt to found a four-colour system of colour printing was the Complementary Colour process of Mr. C. G. Zander, which was patented in 1905. The inventor assumed that it was necessary to use not three but four fundamental colours, viz., red, yellow, green and blue, by mixtures of which in suitable proportions any colours in nature could be matched or reproduced. The hues of these four fundamental (or monochromatic) colours may in popular terms

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be described as magenta red, lemon yellow, emerald green and ultramarine blue. The four colours were grouped into two pairs of complementary colours, viz., red and green, yellow and blue, so that when the elements of either pair were mechanically mixed as pigments, by printing or staining they produced black. At first sight it might seem that the only difference from the ordinary process was the addition of a green printing colour, but actually the other colours have been scientifically adjusted, or readjusted, so that they form two pairs of complementary colours. The author of this process claimed that practically the whole range of the spectrum colours could be produced by it, besides extra-spectral purples, dense pure black, and homogeneous greys. Mr. Zander asserts that no pure black can be reproduced at all in three-colour printing, whilst by his new process either of the two pairs would produce black or grey. Several specimens were produced by the process, and it certainly appeared capable of rendering more brilliantly the bright colours of flowers, ribbons, etc., but the results were not entirely convincing, probably through the engravers not having sufficient practice with the new method. Printers did not view with favour the idea of a fourth printing, and on the whole the process was received so coldly that the inventor has not pushed it further. An example by Mr. Zander's process is given amongst the illustrations in this book.

It may here be remarked that whilst the attention of one class of experimenters has been turned to four-colour printing, another section has tried to secure presentable colour effects by two-colour impressions. A greenish blue combined with a brown has, for instance, been made to yield a pleasing landscape with sky and water. A bluish grey combined with a red has effectively produced a portrait with a good flesh tint. Another way was to print in red and blue on a lemon-yellow paper. The blocks for such combinations had, however, to be suitably etched to get the best effects.

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An example of the Zander process.
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HAND COLOUR WORK

A curious effect of printing in two colours which had some vogue for a time was the Plasticine process, which consisted in printing the two parts of a stereoscopic view, one in pinkish red and the other in greenish blue, superposed over each other. The resulting print looks horribly out of register, yet when it is viewed through spectacles of which one side is green and the other red the two prints coincide, and give quite startling stereoscopic relief.

Whilst photographic reproduction of colour has been progressing apace, there has always been done with a considerable amount of success what may be termed "hand colour work," in which photography played quite an unimportant part. The simplest process of the kind is where a black outline is filled in with colours, in the lithographic way of drawing, but for the purpose of making relief blocks for letterpress printing. The key might, for instance, be drawn direct on a zinc plate, or might be put down on the latter by photo-lithographic transfer. From this plate as many transfers or "set-offs" were pulled as there were colours to be printed, and these were put down on other zinc plates. The solid colours were painted in, or if lighter tints were wanted, stipple or line shading was put down by means of "shading mediums." A great amount of this kind of work is still done for cheap journals printed in colours, such as the American Sunday newspapers, the weekly editions of such Parisian papers as *Le Petit Journal*, *Le Petit Parisien*, etc., and also for a certain class of comic journals, which are very popular on the Continent. The English journal, *Puck*, which has been mentioned in the previous chapter, is illustrated with blocks produced in this way.

A superior class of work is produced by the analogous Goupil process (used for such journals as *Le Figaro Illustré*), a kind of inverted aquatint, the grain being in relief instead of in intaglio. The key outline is set-off on to plates grained by allowing a resin dust to fall on them—this being fixed with heat—and slightly etched. Then the artist proceeds to stop

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out and re-etch the grain tint in gradations of tone. The parts which are first stopped out are the darkest, and the other parts become lighter as the etching progresses. Some parts are cut out so as to print white, or allow the next colour to print pure.

A similar practice is pursued with half-tone prints. Only one half-tone negative need be made of a coloured picture, and this negative will furnish as many prints on the metal as the number of colours required. The resulting plates are stopped out and re-etched until each contains the requisite colour image. This method is the basis of a large amount of commercial colour work done in America, and also of the process called Autochrome, largely used on the Continent for the production of coloured postcards. In the latter method, however, it is usual to print the coloured tints on the litho machine, and the half-tone key by letterpress. Naturally the success of all such processes depends entirely upon the skill of the etchers who make the colour-selective plates. The Prescoltint process of the Press Etching Co., of which we give an example, comes under this category.

Attempts have been made from time to time to make colour plates by means of a grained screen placed in front of the sensitive plate in the camera, the idea being that a much more pleasing and artistic result would be obtained than with the ruled screen, but the results have not been convincing. Perhaps the most effective specimens have been those produced with the Metzograph screen invented by Mr. James Wheeler. The firm of C. Angerer & Göschl, of Vienna, who have done much excellent work in monochrome with this screen, have essayed its use for colour work, but have not thought it practicable to use it for all the colour plates. In a plate entitled "A Cool Drink," published in the *Process Year Book* (Volume XLI), the Metzograph screen was used effectively for the fourth printing in black, whilst in the four-colour plate, entitled "The Fishermen's Children," printed in Volume XIII of the same annual, three of the colours, yellow, blue and

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BEATA BEATRIX

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black, were done with the Metzograph screen, and the fourth was a half-tone. The only published example that we know of, produced entirely with this screen, is that of " The Musketeer " (Meissonier), reproduced in three-colour in the studios of George Newnes, Ltd., and printed in the *Process Year Book* for 1908-9 (Volume XIV). Side by side with it was printed the same picture done with ruled screens by the Anglo Engraving Company. Both were excellent reproductions, each with special characteristics, and it was hardly possible to decide, without having the original picture before us, which was the better of the two, though it was noticeable that the Metzograph had a nice softness of effect which would no doubt be the more pleasing result to the artistic eye. Another example of colour work with the Metzograph screen, also by G. Newnes, Ltd., is included amongst the illustrations to this book. In the same annual, Volume XV (for 1909-10), there was an example of screenless three-colour work by Messrs. André & Sleigh, Ltd. This was done by a grain process, but the description seems to imply that the grain had been imparted to the plate by some such method as the Goupil process already described. The colour print entitled " The Streams," included in this book, is produced by Messrs. André & Sleigh's process.

Grain colour work by relief blocks, it is generally thought, must inevitably be coarser than similar results printed by lithography, and many efforts have been made to adapt photographic processes to lithographic printing. At the time of writing, however, it cannot be said that these efforts have been conspicuously successful from a commercial point of view. This may be due in part to the prejudice and conservatism of lithographic printers, who have taken up the processes in only a half-hearted way, or have failed from want of experience in adapting their existing methods to the handling of the new processes. The Photostone process was one of the earliest efforts to apply " process " to the preparation of the stones for lithographic printing. It was a method in which only one negative was taken. As many prints as the

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number of colours required were made from it, and lithographic artists proceeded by a system of elimination to take away the parts not required on each colour plate, at the same time strengthening or retouching the parts to be printed.

The Photochrom process is understood to be somewhat of the same nature, the tint colours being printed by lithography, but the key printing is believed to be by collotype. The printing of the colour stones is understood to be done by means of a sensitive bitumen film, which reticulates into a granular structure in drying. When this sensitive film is printed under a negative, the grain seems to be developed in a discriminating manner, so as to reproduce the tones of the original.

The Frey process is understood to be on similar lines, and the results produced have been very fine. The process was acquired by Messrs. Hudson & Kearns, but for some reason or another they abandoned it. The process is, however, still worked with success by Messrs. Frey & Söhne, in Zurich.

The firm of Van Leer & Co., at Amsterdam, are doing some excellent three-colour process work by lithography, using the Metzograph screen for one or two of the colours, possibly the yellow and red, and the half-tone screen for the blue and black.

The Unione Zincografi in Milan are working an excellent lithographic colour method, and we believe the feature of it is that three-colour blocks are first made, and after being fine etched to get the most perfect colour rendering, transfers are pulled on thin zinc, so as to overcome the difficulty of stretching or shrinkage which occurs with paper transfers, and prevents proper register being obtained.

One of the difficulties of the lithographic colour process has been that with screen work the high lights are covered with dots which, if too fine, are apt to etch away, or if too coarse give flatness to the picture. Mr. Frederick Sears attempted to overcome this by means of his " high-light " process, which was a method of eliminating automatically in the negative the dots in the high-light portions, so allowing the half-tones

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DOMINO

kindly printed by Messrs. Geo. Mann & Co., Ltd.,
on offset Rotary Litho Machine.

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to grade down to pure white. This is a much better way than the method of elimination by hand-work.

The introduction of the Offset method of printing has given a new impetus to the application of half-tone and other photographic processes to lithography, as it was found that the half-tone was much better printed by this method than by the ordinary flat-bed system. The principle of the process is that the impression is first made on a rubber covered cylinder, and then an " offset " from this is made on to the paper. Half-tones up to 200 lines to the inch have been perfectly printed, and with a delicacy and softness impossible of attainment by block printing, especially where the impressions had to be made on rough and uncoated papers. The earliest attempt we are aware of in England to apply the half-tone colour process to the offset press was made at the instance of Messrs. Geo. Mann & Co., for printing on their offset press, and was published in the *Process Year Book* for 1909-10, the title of the picture being " A Spanish Beauty." There were five printings, red, yellow, blue, flesh and a neutral tint. The printing is on a rough surfaced paper, and though the result is not artistically what it might be, it demonstrates the cleanness, softness and good register possible by this method. Included in this book is a more recent example of their work, " Domino." Good colour work, mostly from hand-drawn plates, had previously been produced on the Potter and other offset presses in America. The firm of Donnelley, Sons & Co., in Chicago, have made extensive experiments in offset printing, under the direction of Mr. J. Albert Heppes, and produced some excellent work in half-tone and colour. Offset printing is now making great progress both in England and America, and undoubtedly it must be reckoned a considerable factor in the future development of colour printing. Its importance lies in the fact that durable and plain surfaced papers can be used, instead of the highly coated and perishable papers usually employed for typographic half-tone and colour printing. Some isolated attempts have been made to utilise ordinary

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surfaced papers for such work in letterpress printing, one notable example being a colour print on super-calendered paper by Mr. A. Chris. Fowler, published recently in the *Caxton Magazine*. The London County Council School of Photo-Engraving contribute to this book an example of three-colour printing on pure rag paper. The average printer has, however, fallen back on the glossy surfaced papers as presenting less difficulty, and has endeavoured to impart a grained surface by passing the sheets between paper-graining rollers, either a canvas grain or an imitation stone grain being usually employed.

Were it not for certain inherent difficulties of the process, collotype would be the most perfect method of colour printing, and would entirely supersede lithography for any subjects that could be reproduced by photography. The printing plate in collotype is prepared by coating a thick glass plate with gelatine mixed with a bichromate salt, which makes the film sensitive to light. The effect of exposing such a plate under an ordinary photographic negative is that the gelatine is more or less hardened according to the intensity of the light action. For instance, in the most transparent parts of the negative, which correspond to the darkest shadows of the picture, the hardening action is strongest, and the hardening effect diminishes until in the portions under the most opaque parts of the negative (the high lights of the picture) there is practically no action. Now a gelatine film which has been so acted upon will absorb water in exact proportion to the hardening, and as water repels a greasy ink the result of passing an ink-charged roller over the plate is that the parts most hardened by the light action take up the most ink, whilst the high-light portions, being largely charged with moisture, repel the ink. Between these two extremes there is an almost perfect scale of gradation of tones formed by different intensities of the ink. Thus we have a picture which corresponds with the tones of the photographic negative. It would seem to be quite simple, therefore, to make three negatives through colour filters, prepare three collotype plates from them, ink

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up these plates with the respective colours, and superpose the impressions of the three plates on one sheet of paper. But in practice great obstacles occur. A gelatine film in a moistened state is very susceptible to atmospheric changes, so that it is hardly possible to get the three printings of equal strength and quality; moreover, the moisture in the plate affects the ink, the rollers and the paper, causing further variations. There must, therefore, be a considerable proportion of waste impressions in an edition, making the process slow and expensive. Such examples of coloured collotype as have been seen—and there has been most excellent work done by this process—probably represent the best impressions selected from a large number printed. Amongst firms who have done and are doing excellent collotype work in colour may be mentioned Herr J. Löwy and Herr Max Jaffé in Vienna, Messrs. Bemrose & Son, Ltd., Derby, and Messrs. W. Griggs & Son, Peckham.

It has long been thought that the ideal process for colour printing would be photogravure. In this case copper plates are engraved or etched in intaglio, the picture being formed by a resinous or bituminous dust grain, as in the case of the old aquatint process described in a previous chapter, but instead of the gradation of tone being produced by hand-work it is rendered by the action of light through a photographic negative (or rather positive, since it is an intaglio process) on to bichromated gelatine tissue. In the same way as we have described in collotype, the action is that of more or less hardening the gelatine, but instead of using this property as a means of inking it is employed to form a resist to the etching fluid. The gelatine tissue being transferred to the copper, after the latter has been furnished with a grain, the etching mordant is applied and penetrates the film in exact proportion to the light action. The etching proceeds most quickly in the shadows and consequently goes deepest. Thus these parts hold the most ink and give the densest deposit on the paper. For colour printing this would seem to be a decided advantage,

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as it exactly reproduces the artist's way of applying pigment to paper or canvas, and naturally many attempts have been made to apply this process to colour reproduction. The difficulty, however, is that of register, first in the printing and transferring of the gelatine tissue, and secondly in the fact that copperplate printing must be done with damped paper. The inking and wiping of the plate also introduces further chances of inequality. In spite of these difficulties, however, some excellent results have been shown, though it is probable they were picked specimens, and it would be interesting to know what was the proportion of spoilt impressions. Of course a single photogravure plate can be locally inked with dabbers or brushes, as described in earlier chapters in connection with the old intaglio processes, and this is generally done in the case of the large coloured photogravures produced at the present time.

Reference has been made in a previous chapter to the Rembrandt process, which is an intaglio one based on the photogravure principle, but instead of a dust grain on the plate, a ruled screen is printed on the tissue. The object of this screen is the same as that of the dust grain, viz., to give a discriminating ink-holding property to the plate. But it does more than this: it enables the engraved surface to be mechanically inked and wiped. The etching is done on copper rollers, and these are placed in a rotary printing machine, in which a roller applies the ink to the printing cylinder, and a steel knife scrapes it clean from the surface, leaving it in the hollows of the engraving. The paper, drawn from a reel, passes between the printing cylinder and an impression cylinder, and thus there is a continuous and rapid production of prints. This is assumed to be the process adopted by the Rembrandt Intaglio Printing Co., who, however, have so well guarded the secret of the precise method they use, that little or no information has leaked out as to the exact details. After producing for about ten years most excellent prints in monochrome, this company has applied the same process of printing

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to the production of colour prints, and have shown some very fine results. It may be assumed that additional printing cylinders with separate inking, wiping and impressing arrangements are carried in the same machine, so that the colours are consecutively impressed during the single traverse of the paper through the press. In this way good register and uniformity of prints is attained, but the greatest difficulty is no doubt to get the colours to blend perfectly whilst in an undried state.

Simultaneously an American inventor, Mr. C. W. Saalburg, has been working on a similar method, and has also succeeded in producing fine results. Some of his prints have appeared in the *Inland Printer* and the *Printing Art*, which fact implies that the process is capable of being utilised for commercial editions, whilst the Rembrandt colour process has only so far been employed for producing comparatively expensive prints for framing. The example of the process, " The Conference," included in this volume, however, shows the capabilities of that process for book illustration.

A process understood to be based on half-tone intaglio printing, called " Autogravure," is being used by the Vienna firm of C. Angerer & Göschl, and the results yielded by it are very fine. Some of the prints are embossed, so as to reproduce the impasto effect of the artist's painting. A feature of the process is that pure white pigment touches in the picture are reproduced with great fidelity.

The reproduction of the designs of carpets and coloured rugs has always tempted the colour process worker, and some wonderfully good work of this kind has been done by three and four-colour screen processes, but it has never achieved the faithfulness and beauty of the lithographic method known as " flock printing." This consists in printing the colours with a very tacky varnish ink, and dusting over, as in gold bronzing, with coloured wool dust or " flock." The result gives a most velvety texture to the print, suiting the subject very well. Sometimes the process is varied by printing with coloured inks on flock paper, instead of dusting. We have heard

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that the process has also been applied to letterpress printing from three-colour blocks.

An ingenious process of printing several colours from one plate is the invention of Mr. G. R. Hildyard, and consists essentially in the cutting out of a thick overlay corresponding to each colour. By attaching this to the cylinder or platen of the press, the parts of the plate not intended to print receive no impression, and therefore do not appear on the paper. A still more curious process by the same inventor consisted in cutting out the key outline of a design in high relief from a special composition, so that there were deep spaces in between the lines. These spaces were filled up with powder colours. A varnished sheet, whilst still tacky, was laid over the outline plate, which was then inverted. The powder colours attached themselves to the varnished sheet, and thus as many colours as desired were transferred to the sheet at one impression, the surplus colours being brushed off as in bronzing.

Another way of printing several colours from one plate is to cut out masks or stencils, which are interposed between the plate and paper so as to stop off certain parts. By using several stencils a similar number of colours can be obtained.

It is only possible to refer very briefly to the numerous processes put forward from the earliest inception of the three-colour process, for obtaining colour prints by first printing on the paper a series of coloured lines or dots, and afterwards printing upon this a black image. The theory is that if the paper is covered with parallel lines in close juxtaposition, and alternating in groups of red, green and violet, a grey surface is produced, and if a block is made through a glass screen of a similar character, this block will have the property of stopping out the coloured light reflected from the lines, in such a way that the parts of the lines remaining uncovered will reproduce the colours of the picture. The difficulties of the process lie in the amount of light absorbed, and the impossibility of getting pure pigment colours, so that the results have been

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very weak and dull. The idea has, however, been very effectively applied by Mr. Julius Rheinberg for producing ornamental patterns, and an example was given in Volume XV of the *Process Year Book*.

Of late there have been developed several processes of "screen plate" colour photography, in which a glass plate is first provided with a parti-coloured screen of lines or dots in groups of red, green and violet, and over this screen is spread the sensitive photographic emulsion. The exposure is made through the parti-coloured filter. The result is that when the image is developed a coloured transparency is seen, but the colours are complementary to the hues of the object. By a process of chemical reversal the image is converted into a positive, and then the primary hues appear and a more or less effective colour photograph results. In theory it should be possible to decompose these screen plate pictures into their separate colours by taking three negatives from them through colour filters, and then to make printing blocks from the three negatives, but in practice this is very difficult to accomplish, and so far we have not seen any good results from this method. The Autochrome screen plates of Lumiere have, however, been copied as coloured pictures by the ordinary three-colour method, and have yielded very fair results. The colour print by John Swain and Son, Ltd., is reproduced from an Autochrome portrait from life by the Dover Street Studios who are making a speciality of this work.

In the *Process Year Book* for 1907-8 the Warner-Powrie process is described. This consists of reproducing natural colours by means of closely juxtaposed lines, alternating red, green and violet on the screen, and printing in red, yellow and blue. An example is printed showing how the complementary colour negative made by this process can be converted into tricolour blocks.

Another process which has been latterly coming to the front is the "Thames" Colour Plate, and as the colour elements resemble half-tone dots an attempt has been made with some

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success to dissect the three-coloured dot systems from the one plate on to three plates and so make tricolour blocks therefrom.

No doubt three-colour photography from nature for reproduction by colour printing will eventually be done by such processes as these in preference to the somewhat clumsy method of first making three monochrome negatives of the separate colours.

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INDEX

(ROMAN NUMERALS REFER TO THE PREFACE)

ACKERMANN, R., publisher and lithographer, 106, 109, 175
Albert, Dr. E., photo-engraver, 226, 257, 258
—— J., printer of colour collotypes, 226
Alix, P. M., colour aquatinter, 103
Allen & Co., printers of colour photogravures, 224
Almanacs, colour printing in, 33
—— English, colour printing in, 37, 38, 39
Altdorfer, A., wood engraver, 20
Aluminium, its use in lithography, 215
Andreani, A., Italian chiaroscurist, 23
André & Sleigh, three-colour engravers and printers, 265
Angerer & Göschl, engravers and colour printers, 217, 235, 271
Aquarelles, 105, 248
Aquatint engraving, origin of, 98
—— —— description of, 98
—— —— for colour work, 98–9
Aquatints in colours, French, 105
—— —— English, 105–6–7
—— hand coloured, 106
Aquatype colour stencilling machine, 249
Aresti, J., chromo-lithographer, 207
Ars Moriendi Block Book, 2
Art Photogravure Co., 222
Arundel Society and chromos, xii, 211–2
Astronomical treatise of J. Holywood, colour printing in, 6
Audsley, W. and G., their colour illustrated books, 209–10
Autochrom process, 216
Autogravure process, 271

BALDUNG, H., 18, 30
Barth, J. A., first chromo-lithographer, 176
Bartolozzi, F., engraver, 89, 90, 94, 97
—— F., coloured stipples by, 93
Baxter, Geo. (engraver and colour printer), *v.* Savage, 119–20
Baxter, Geo., his colour printing process, 124 *et seqq.*
—— —— his earliest colour prints, 125
—— —— his Patent, 126, 129–30
—— —— his printing methods, 127–8, 204
—— —— his colour prints, 128
—— —— estimate of his work, 131
Baxter's *Pictorial Album*, 127
Bewick, J., on colour prints, 77, 79
Bijlaert, J. J., stipple engraver in colour, 85
Bindings, decorative, 192–3
Binns & Goodwin, colour printers, 169
Blake, W., his colour etchings, 111–12
Block Books, 2
Bloemaert, F., Dutch chiaroscurist, 26
Bocardo, A., printer at Paris, 32
Bonnet, L. M., French stipple engraver, 84
—— his colour prints, 84–5, 102
Book covers, coloured, 157–8
Book of Common Prayer (1549), 37
Borders, coloured, in books, 169
Bosse, A., copperplate engraver, 43
Botanical colour-printed plates, xii, 67–8
Boussod, Valadon & Co., printers and publishers, 235
Boys, T. S., his colour-illustrated books, 194
Bradshaw & Blacklock, colour printers, 136
Breton, on coloured printing inks, v.
British and Colonial Printer and Stationer, viii, 136
Brooks, Vincent, colour printer, 130, 132, 136, 208, 211
Buck, A., aquatints after, in colours, 105
Burch, J., Rainbow printing, 121
Burgmair, H., 19
Busingk, F., French chiaroscurist, 27

Digitized by Google

INDEX

CARPI, Ugo da, 16, 22
Cartwright, lithographer, 207
Cassatt, M., colour-etcher, 251
Chiaroscuro, 13
—— German, 18
—— modern imitations of, 80
—— bordered title-pages, 29 *et seqq.*
Chidley's (S.), books printed in red, 41
Chiswick Press (The), its colour work, 137 *et seqq.*
Chromo lithography, books on, 210
—— —— first journal printed by, 210
—— —— modern French, 219
Chromotype process, 217
Chromotypogravure process, 234–5–6
Clowes, printer, 142–3, 185
Cohn, M., photo-mechanical colour printer, 227, 256
Collen, H., his colour printing method, 254
Collotype printing, its origin, 225–6
—— —— in colours, 226–7, 229, 267
Colonia, P. de, printer at Seville, 9
Coloured Pictorial, 242
Coloured paper in books, 37
Colourtype process, 238
Combination colour processes, intaglio, 96
Congreve, Sir W., his colour printing process, 121
Cooper, Clay & Co., colour printers, 168
Cordova, F. de, printer at Valladolid, 36
Coriolano, B., Italian chiaroscurist, 25
Cranach, L., 18
Crayon drawings in colour, printed imitations of, 83 *et seqq.*
Cros, C., his colour printing process, 230, 254
Crozat collection of prints, colour reproductions from, 69
Cunio Brothers, alleged wood engravers, vii

DAGOTY, A. E. G., colour prints, 62–3
—— E. G., colour prints, 63–4
—— G., colour prints, 65
—— G. F., colour prints, 63
—— J. G., and the Le Blon process, 59
—— J. G., three and four-colour prints, 59
Dalziel Bros., colour printers, 169
Danesi's colour photogravure process, 224
—— three-colour collotypes, 229
Day, W., lithographer, 182
—— & Haghe, chromo-lithographers, 190
—— & Son, chromo-lithographers, 200, 202, 206, 207, 209
Day's shading mediums, 241
Debucourt, P. L., colour aquatinter, 102
De la Rue, T., his coloured printing inks, 168
—— T., his colour lithography, 182–3, 201
—— T., his printing in gold, 187
Demarteau, G., French stipple engraver, 85
Descourtis, C. M., colour aquatinter, 104
Devices, printers', in two colours, 33, 40
Dickes, W., colour printer, 133–4
Dickinson Bros., publishers and chromo-lithographers, 200
Dicksee, J. R., chromo-lithographer, 201
Dietrich, C. W. E., engraver in chiaroscuro, 77
"Direct" half-tone process, 258
Domesday book, in two colours, 212–13
Double-tone inks, 240
Ducos du Hauron, L. A., his colour printing process, 230, 254
Dürer, A., 17

EGYPT, chromo-lithography in, 207
Eighteenth-century colour prints, 89, 92
"End papers," early coloured, 75
Engelmann, G., chromo-lithographer, 177, 179 *et seqq.*, 196
—— and Graf, chromo-lithographers, 181
Eragny Press colour illustrated books, 244–5
Etching in colours, 246, 250, *et seqq.*
—— —— in France, 247
Evans, Edmund, engraver and colour printer, 154 *et seqq.*
—— —— his early colour work, 154
—— —— chiaroscuro colour work, 156, 209
Exhibition of 1851 (London), 167, 199 *et seqq.*

Digitized by Google

FAWCETT, Benj., engraver and colour printer, 159 *et seqq.*
—— —— his colour work, 162
Ferzoe, *Science Pratique de l'Imprimerie*, v
Figaro Illustré, colour plates in, 235
—— *Modes*, colour plates in, 236
Flock printing in colours, 271
Four-colour half-tone printing, 239, 261
François, J. C., French stipple engraver, 83
—— —— his colour prints, 83–4
Frankau, J., modern copies of old colour prints, 94
Frey colour printing process, 266
Fox-Talbot's photo-engraving process, 220
Fust & Schoeffer, printers at Mentz, 4, 5, 6

GILLOT, engraver for colour printing, 247
" Gillotage " etching process, 247–8
Goltz, Hubert, 28
—— Hendrik, 28
Gold, printing in, 10, 185
Gospels of Ulphilas, vii
Goupil & Co., colour printers, 222–3, 234, 263
Graf, C., chromo-lithographer, 189
Graphic, colour plates in, 172
Greek books, colour work in, 32, 38
Gregory, Collins & Reynolds, colour printers, 145–6
Griffiths, H., colour etching process, 246
Griggs & Sons, colour printers, 216
Grimm & Wursung, printers, Augsburg, 34
Gubitz, F. W., his colour prints, 79, 80
Gutenberg, J., 2, 4

HAFFNER, J. G., colour printer at Mentz, 49–50
Half-tone colour printing methods, 234
—— —— —— early French, 234–5–6
—— —— —— early English, 237
—— —— —— early American, 238
Hancock's caoutchouc binding process, 191
" Hand-colour work " in half-tone printing, 263
Hanhart, M. & W., chromo-lithographers, 196 *et seqq.*
—— —— their chromo-litho process, 199
Hay, W., machine wood engraver, 169
Helmholtz, Prof., his colour theory, 253
Herzog, J., printer at Venice, 8
Hildebrand, C., chromo-lithographer, 178
Hildyard, G. R., his colour printing inventions, 219, 272
Hodson, S. J., his " Chromographic " process, 171
Hopyl, W., printer at Paris, 37
Horae, early Parisian, 9, 13
—— of B.V.M. (1490), 9
Hullmandel, C., lithographer, 182, 193–4–5
—— & Walton's colour printing, 196, 200
Humphreys, Noel, his colour-illustrated books, 152, 189
Husnik & Hausler, engravers, 239

" ILLUMINATED " books, 188, 190, 192
Illustrated London News, coloured plates in, 147
Illustrations, colour-printed, in early scientific books, 42
" Indirect " three-colour process, 256
Initials, early two-colour, 4, 5
Inks for colour-printing, v, vi, 120–1 259
Intaglio engravings in colours, methods of inking for, 88
Ives, Fredk. E., inventor of the three-colour process, 231–2, 237, 255

JACKSON, J. B., engraver in chiaroscuro, 72 *et seqq.*
—— —— paperhangings in colours, 74
—— —— *Essay on Engraving*, 75
Janinet, J. F., colour aquatinter, 103-4
Japanese colour prints, 112–13–14
Jaumer, J., printer at Paris, 9
Jeanniot, M. P. G., colour-etcher, 250
Jones, Owen, chromo-lithographer, 150, 183
—— —— his *Alhambra*, 185, 187–8
—— —— " illuminated " books, 188–9

Digitized by Google

Jones Owen, *Grammar of Ornament*, 205–6
—— —— chromo - lithographed books, 207–8
Justinian's works, colour printing in, 32

KAUFFMANN, Angelica, artist, 86–89
Kelmscott Press colour printing, 191
Kirkall, E., his chiaroscuro mezzotints, 67–8
—— E., his coloured mezzotints, 68–9
Klic, K., photogravure process, 221
Knapton, C., his chiaroscuro etchings, 70
Knight, Chas., his "illuminated printing," 141 *et seqq.*
—— —— colour prints in his *Old England*, 143–4
Knöfler, H., sen., engraver and colour printer, 164
—— —— his early work, 165
——, H., jun., engraver and colour printer, 166
——, R., engraver and colour printer, 166
—— Bros., their colour prints, 167
Kronheim, J. M., colour printer, 134–5–6
Kurtz, W., his colour printing, 238, 255

L'ADMIRAL, J., three-colour printing, 66
Lahure & Co., colour printers, 234, 236
Lalleman, G., 27
Lambert colour printing machine, 260
Lasinio, C., three-colour prints, 64–5
Lasteyrie, Comte C. P. de, his colour lithography, 179
Laurie, R., mezzotinter in colour, 87
Le Blon, C., three-colour process, 51 *et seqq.*
—— —— —— —— Patent for, 54
—— C., H. Walpole's opinion of, 55
—— C., G. Vertue's opinion of, 55
—— C., tapestry process, 56–57
—— in France, 58
Le Blond & Co., colour printers, 132–3
Leighton, Geo. C., colour printer, 126, 129, 145 *et seqq.*
Leighton Bros., their colour printing work, 148–9
Lemercier & Claye, chromo-lithographers, 204
Le Prince, J. B., inventor of aquatint, 99
Le Sueur, N., chiaroscuro etchings, 69
—— V., engraver for colour work, 70
Letter of Indulgence (1454), 2
Letterpress printing in colours (18th century), 49, 50, 110, 168
—— —— —— French (19th century), 172–3
Levy's automatically ruled screens, 237
Lewis & Böhm, colour photogravure process, 221
Lewis, Courtney, his book on Baxter, ix
Liechtenstein, P., printer at Venice, 33
Line engravings in colours, early, 42 *et seqq.*
—— —— —— (Lastman's & Schenck's), 43
—— —— —— (Teyler's), 44
—— —— —— (Mitelli's), 47
—— —— —— (in "Turkish Carpets"), 47
—— —— —— (J. Robert's), 66
—— —— —— modern, 241
Lithography, invention of, 174
—— early, in colour, 175
—— three-colour, 177, 179, 207, 266
Lithographic printing machinery, 201
Locatellus, B., printer at Venice, 7
London Colour Printing Co., 242
Lottery Bills, printed in colours, 122–3
Lumiere autochrome screen plates, 273
Lutma, J., his engravings in "Opus Mallei," 83
Lydon, F. A., engraver for colour work, 161

MACHINERY for colour printing, 259
Mackenzie, W., his colour printing method, 168
McLean, T., publisher and lithographer, 202
Mair, early German artist, 17
Mann, Geo. & Co., and the offset process, 267
Manuscripts, illuminated, 1, 3

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INDEX

Marbling, 48
Marples, D., colour printer, 169–70
Maxwell, Prof. J. Clark, his colour theory, 230, 251
" Mazarin " Bible, 4
Medici Society's colour prints, 228
Meisenbach, G., photo-engraving method, 233
Mentz Psalters (1457–9), 4
—— Canon of the Mass (1458), 4
Metzograph screen, 264
Mezzotinting, invention of, 52
Mezzotints in colours, 66–7, 87, 90, 92
Miehle press (Tandem) for colour printing, 260
Million, coloured plates in, 242
Missale Speciale, 5
Missals, Ratdolt's, 10, 31
Montdorge, G. de, on the Le Blon process, 61
Morris, Rev. F. O., his colour illustrated books, 160–1
Mulinari, S., his colour prints, 96
Multi-colour half-tone printing, 240
Multitone process, 217

NEALE'S colour photogravure process, 224
Necker, Jost de, 16, 19
Nelson & Sons, their chromo-litho. process, 203–4
Newspapers, introduction of colour printing into, 147, 260
Newton's (Isaac) theory of colour, 51
Nicholson's *Dictionary of Chemistry*, on red ink, vi

" OFFSET " litho printing process, 215–16, 267
Oleographs, 212
Orloff press, 259

PAPER, old, 15
Paperhangings, early coloured, 75–6
Papillon, J. M. B., wood engraver, 77
—— on coloured printing inks, v
Paris Illustré, colour plates in, 235
Pegnitzer, J., printer at Seville, 33
Penrose & Co., 226
Photochromatic Printing Co., 227, 237, 256
Photochrom process, 214, 266
Photo-chromo-lithography, 212, 214, 216
Photo-chromo-xylography, 214
Photography, early, 220
Photogravures in colours, 222, 269
—— —— machine-printed, 223, 271
Photostone process, 265
" Picture Office " (Le Blon's company), 53–4
Pingrenon, his bibliography of coloured books, xi
Plasticine process, 263
Playing cards, in Venice (1441), viii
—— —— early 15th century, 7
—— —— (designs of), in Ghisi's *Laberinto*, 42
Polygraphic process, xii, 109
Pond, A., his chiaroscuro etchings, 70
Portalis, Baron, articles on colour printing, x
Portesio, A. de Z. de, printer at Venice, 34
Pré, G. de, printer at Paris, 35
—— J. de, —— —— —— 9
Prescoltint process, 264
Preissig, V., his book on colour-etching, 251
Prestel, J. T., aquatints in colour, 107–8
Pretsch, P., his photogravure process, 221
Printing, early, in the Far East, vii
—— in colours, articles on history of, viii
—— press, old, 15
—— —— triple (Lalleman's), 27
Process Year Book, 264, 265, 267, 273

RACQUET Court Press (The), 158–9
Raffaelli, M. J. F., colour-etcher, 251
Ransonnet, Baron, his colour printing method, 254
Ratdolt, E., Venice, 6, 9
—— — Augsburg, 10, 31
Rationale Div. Off. of Durandus, 5
Rees' *Cyclopædia*, on coloured printing inks, vi
Rembrandt Intaglio Printing Co., 223, 270–1
Repetitis Tituli of De Montibus, 8
Rheinberg, J., his colour printing process, 273
Richardson, M. A., colour printer, 170
Robert, A., and the Le Blon process, 59–61
Rogers, E., colour printer, 170
Roulette, for engraving, 104
Rowley's patent for coloured printing ink, vi

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Rowney, F. W., his "Typochromatic" printing, 168
Royal Printing Office, Paris, its colour work, 163
Rubricated books, 3
Rugendas, C., his colour mezzotints, 96
Ryland, J. J., stipple engraver, 85 *et seqq.*, 97

SAALBURG, C. W., colour photogravure process, 271
St. Albans Press, 8
—— *Book of*, 8
—— *Chronicle*, 8
St. Anthony, early colour print of, 12
St. Christopher, woodcut of (1418), viii
St. Bride Foundation Technical Library, xi
Salaman, M. C., on old English colour prints, 90
Sanctis & Santritter, printers at Venice, 7
Savage, W., on coloured printing inks, vi
—— W., his "Decorative Printing," 116 *et seqq.*
Scacciati, A., his colour prints, 96
Schott, J., printer at Strasburg, 29
Schreiber collection of early prints, 12
Screen-plate colour-photography, 273
Screens for half-tone process, 233
—— —— —— Levy's, 237
——, ruled, angles of, 257
Sears' "High-Light" litho process, 266
Seghers, H., etcher in colour, 43
Senefelder, J. A., lithographer, 174–5–6
Sepia, printing in, 138
Shaw, H., his colour illustrated books, 137–8
Silbermann, G., colour printer, 163
Silk and satin, pictures printed in colours on, 95
Skippe, J., engraver in chiaroscuro, 78
Slaughter, S., engraver in chiaroscuro, 71
Stanhope press, 15
Stencilling in colour, 21
Stereotype, printing from, in two colours, 111
Stipple engraving, origin of, 82
—— —— for colour work, 87, 92–3
Storch & Kramer, chromo-lithographers, 212
Storck, J., chromo-lithographer, 178

TEXTILE fabrics, colour printing on, 145, 170
Teyler, J., his colour prints, 44 *et seqq.*
"Thames" colour plate, 273
Thaulow, F., colour-etcher, 250
Thornton, Dr., colour prints in his book, 92, 104
Three-colour photography, 274
"Three-colour" printing, its origin, 232
—— mezzotints (Le Blon's), 51 *et seqq.*
Transfer lithography, 203
Trento, A. de, Italian chiaroscurist, 23
Tridino, G. de, printer at Venice, 7
Trichromatic printing, its theory, 231
Trowbridge, V., colour-etcher, 250
Two-colour printing in half-tone 240, 262

ULRICH, his colour printing process, 254
Underwood, T., chromo-lithographer, 200

VAN AMSTEL, J. C. P., colour aquatinter, 100
—— —— his colour prints, 100–101
Varro's Peplographia, vii
Verard, B., printer at Paris, 34
Vicentino, G. N., Italian chiaroscurist, 25
Vidal, L., and colour printing processes, 226, 231, 237
Vizetelly, H., colour printer, 149 *et seqq.*
Vogel, Dr. E., and colour photography, 237, 255
—— Dr. H. W., his colour collotype process, 226, 254

WALKER, E., colour engraver and printer, 224
Warner-Powrie colour-photography, 273
Waterlow & Sons, Ltd., their colour collotypes, 227
—— —— their three-colour printing, 238–9
—— —— their chromo-lithography, 209

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INDEX

Watts, S., wood engraver, 81
—— — colour-etchings, 86–7, 97
Wechtlin, J. W., 20
Weiditz, H., German artist, 29, 30, 34
Weishaupt, F., chromo-lithographer, 177
Whitehead, G. & Co., colour printers, 237, 255
Whiting & Branston, engravers for colour work, 122
Whittaker, J., printer in gold, 185–7
Willemin, N. X., engraver for colour work, 97
Woodcuts, early, viii
Wood engravings in three-colours, 243
—— —— in colour, 244

YOUNG, J., mezzotints in colours, 91
—— T., his colour theory, 253

ZANDER'S Complementary Colour Process, 261
Zanetti, A. M., engraver in chiaroscuro, 72
Zinc, the use of, in lithography, 188, 201

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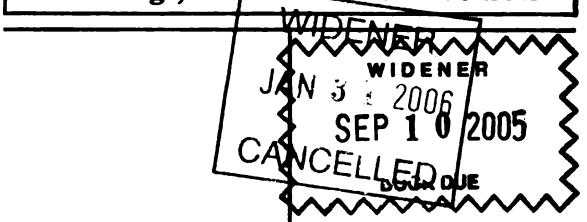

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